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Original Article

Correlation of the mediterranean diet with some diseases

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Abstract
The research was conducted on 38 respondents in total, at the age from 40 to 80 years, grouped as follows: 14 with cerebral tumor, 12 with cardiac ischemia and 12 with colon cancer, who were hospitalized in the University clinical center in Pristine. Five variables were applied during the research: age, height, weight, daily number of smoked cigarettes and KIDMED Index, collected by a questionnaire. BMI (Body Mass Index) was calculated from the height (Height) and the body mass (Weight). The KIDMED questionnaire consists of 16 questions (each having a positive or negative point) that are related to the eating of particular food-types incorporated in the Mediterranean diet. Through summing the points, the so called Index of Mediterranean diet (KIDMED Index) can be obtained, and if the KIDMED Index has the values of ≤ 3, it indicates a low degree and is a mark of little use of the Mediterranean diet, optimal values are 4-7 and it is high with the values of ≥ 8. Along with the descriptive statistical parameters, the following analyses were calculated, too, for each of the applied variables: multivariate analysis of variance (MANOVA), one-factor univariate analysis of variance (ANOVA), post-hoc analysis, contingency tables based on the χ^2 test values and contingency coefficients as well as testing their differences. On grounds of the performed research, it can be stated that the group with cardiac ischemic disease is that of the youngest persons whose average age is 50 years at the time when the disease occurred and the oldest of the respondents – those of 64 years – are the patients diagnosed with colon cancer. Regarding the KIDMED Index, there are statistically significant differences between the groups of different diagnoses (patients diagnosed with cerebral tumor, cardiac ischemia and colon cancer). It is established that the group diagnosed with cerebral tumor has the largest number of patients with a low KIDMED Index (28,6%). Persons of that group have the greatest daily number of smoked cigarettes (H= 7,14) and have in average the highest BMI = 28, which indicates excessive body mass. Although 50% of the cardiac ischemic disease patients have high and optimal KIDMED Index (same percentage in each), yet these patients are the youngest of all three groups. It means that there might be another factor that causes the "inadequate early" strikes of the disease.
Key words: diseases, Mediterranean diet, KIDMED Index.

Introduction

Mediterranean diet has its grounds in the diet principles of the population in Italy and Greece as well as some other countries (France and Spain), which have coastlines on the Mediterranean Sea. According to Silver eco (2020), that type of diet is of the healthiest eating-habits, which is evident from the fact that the greatest percentage of aged people in Europe is that of Greece and Italy (of 26% each in 2000 year). According to the United Nations (2019), though, the country with the largest aging population is Japan - with 42% out of the world's population aged 60 and above and having as many as 70.000 one-hundred-year-old people (Japan is not among the Mediterranean countries, but the Japanese diet is very similar to the Mediterranean one).

The Mediterranean diet, according to Gunnars, K. (2018), means having meal of: whole-grain food (cereals) of rice, oats, rye, barley, corn, legumes (beans, peas, lentils, chickpeas, peanuts), fresh and dried fruits (raisins, figs and dates), vegetables, potatoes, sweet potatoes, seeds (pumpkin and sunflower seeds), nuts (walnuts, almonds, hazelnuts, cashews), spices (garlic, basil, mint, rosemary, pepper, paprika and cinnamon), olive oil (instead of butter), olives, water above all, a glass of red wine, coffee and tea (but sugar free), fish and sea-food (weekly from two to several times), milk, poultry (chicken, duck, turkey), eggs, cheese, yogurt and Greek yogurt (weekly once to twice), red meat (occasionally and in small portions), whereas foods that are not recommended are sweets (cakes, candies), sugary drinks, refined cereals – white bread and white-flour cereals, refined-oil products – soy, canola or cotton-seed oil, as well as processed foods like sausages. It is not only the taken food that counts in the Mediterranean diet pyramid, but the daily physical activity is the part that considers as well, along with having time with the family and friends.

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The Mediterranean diet is believed to be one of the healthiest diets worldwide due to its combination of those types of food that are rich in antioxidants and anti-inflammatory nutrients (Mentella, et all., 2019). According to the mentioned author, many of the applied studies indicate a strong correlation between the high level of adherence to the Mediterranean diet and the low level of some chronic diseases, such as the cardiovascular ones, diabetes and cancer. According to Merra, G., et all. (2021), that type of diet can prevent the occurrence of diseases, such as some cardiac diseases, malignant diseases and diabetes. That diet is considered to be the healthiest type, since the people whose food-habits are based on it are themselves the nations of the longest life expectancy (Italy, Greece, Japan, Spain). Owing to the reduction of bad-fats intake (chiefly animal origin foods, rich in saturated fats and cholesterol) and replacing them with the use of "healthy" fats (omega-3 and omega-6 fatty acids and other unsaturated fats), the levels of cholesterol and blood vessels atherosclerosis are reduced too, which results also in lower risk of high blood pressure and cardiac diseases as well as stroke, which leads to a total human health improvement (Willett, 2006).

According to Willet, W. (2006), eating fruits and vegetables (which are highly present in the Mediterranean diet) can reduce the occurrence of cancers for 32% and death caused by them – for 20-42%. Merra, G., et all. (2021) insist that, Mediterranean diet can prevent the occurrence of heart diseases and some cancer as well as the diabetes and it is believed to be the healthiest eating-habit, since people implementing it are of the longest life-expectance (Italy, Greece, Japan, Spain). According to Martinez-Gonzales, M.A., Gea, A.,&Ruiz-Canela, M. (2019), the Mediterranean diet positively influences the cardiovascular health as well as the ischemic diseases of the heart and heart attack.

Castelló, A., et all. (2018) claim that Mediterranean diet can reduce the risk of colon cancer by 30% in female and 45% in male. While according to Rizzello, F., et all. (2019) the so called "Western diet" with consumption of meat, sweets, dairy, refined cereals, energy drink and sauces can increase the risk of colon cancer in both gender. Ratjen, I., et all. (2017) also suggest that Mediterranean diet in patients with colon cancer can reduce the mortal risk for 11%. Chiara Mentella, M., et all. (2019) claim that Mediterranean diet has a protective effect on some types of cancers like: breast, prostate, gastric, bladder, female reproductive system, pancreatic and lung cancer. Sport practicing (no matter if it is individual or team sports), besides allowing people to gain knowledge about healthy eating, also encourage them to bring the required changes in their diets towards good food choices. The role of Mediterranean diet in recreational sport was estimated by Vasileva, F.,&Shukova Stojmanovska, D. (2020), on 64 people (female 23 and male 41) that were training fitness and body building and were analyzed about the food choice with a KIDMED questionnaire. The results show that 40% from the subjects had optimal and 50% of them high KIDMED index as a measure of Mediterranean diet, which indicates that they were very aware of the food choices or maybe because of the high percentage of overweight subjects maybe they have changed the habits in order to lose weight (3% of them were underweight, 56% of normal weight, 35,9% were overweight and 4% obese). Vasileva, F., et all. (2022) applied the KIDMED questionnaire in order to estimate KIDMED index also on another group of 101 subjects, aged 18-35, that participate in different sports (football - N=24, basketball - N=16, handball - N=15, volleyball - N=20, tennis - N=10, swimming - N=10 and martial arts - N=9). From the results it can be seen that all the groups have optimal KIDMED index (from 5,63 to 7,95) and values of BMI (from 21,4 to 24,95) that indicates normal weight, with a weak association between the two that was not statistically significant.

But sometimes the care about nutrition can lead to some eating disorders even in sports, especially in ones that require optimal weight. According to Parlov, J., et all. (2020) more eating disorders like self-induced vomiting and extreme dieting appear in artistic swimmers than in water polo female swimmers, maybe due to the need for a better look in the first group. Fahmi Hasan, M., Bahri, S.,&Adnyana, K. (2021) claim that in weightlifting in order to maximize performance in certain class, it is very important to have as much as possible muscle and at the same time to minimize the percentage of fat. But obviously something is not good with their nutrition, since their fat percentage is 24,38%, which is too high compared to that of an average weightlifter, which is approximately 16%. Also they have some bad habits like: 2% of them smoke and 3% drink alcohol.

Junaidi, I., et all. (2021) made a research on rugby athletes and their response to nutrition advice and exercising when it was allowed to be present on training sections in 2019 and again in 2020 when due to Covid 19 they were exercising and receive advice on nutrition at home. The BMI in the rugby athletes increased from 24,78 to 25,73 in only one year, obviously due to changed habits in nutrition and exercise. So it is important to educate people and help them learn what food choices are good and which ones are worse, but it is also important to be active and to exercise in order to maintain and improve health.

Materials and methods

Participants

The research was conducted on a sample of 38 respondents in total (N = 20 female and N = 18 male), aged from 40 to 80 and with the following diseases: 14 with cerebral tumor (N = 8 women, N = 6 men), 12 with cardiac-ischemia (N = 6 women, N = 6 men) and 12 with colon cancer (N = 6 women, N = 6 men). They were hospitalized in the University Clinical Center in Pristine. Owing to the small sampling, however, the data processing was not held for each gender separately.

Procedure/Test protocol/Skill test trial/Measure/Instruments

Five variables were applied in the research, as follows: age, height, weight, daily number of smoked cigarettes and KIDMED Index according to Torun, N.T., & Yildiz, Y. (2013). The data of all variables was collected through a questionnaire in order to avoid a prolonged time-spending in the hospital wards during the COVID pandemic. BMI (body mass index) is a variable extracted from the height and weight. World Health Organization (2007) provides the formula for calculating the value of BMI for all groups:

BMI= weight in kg/ height in м^2

- index under 15 is considered a person with extreme underweight
- from 15 to 18,4 – a person with underweight
- from 18,5 to 24,9 – a person of normal weight
- from 25 to 29,9 – a person with overweight
- from 30 to 34,9 – a person with obesity
- over 35 – a person with extreme obesity

KIDMED questionnaire consists of 16 questions (each provides a positive and negative point) which are related to the consumption of particular foods that are part of Mediterranean diet. On grounds of the sum of those points, the so called Index of Mediterranean diet pattern (KIDMET index) can be obtained, namely we can obtain a quantitative confirmation about the food choice. So, if KIDMET index has the values of ≤ 3, it means very low value and it shows that the Mediterranean diet was incorporated scarcely. It is optimal when the values of KIDMED index are 4- 7, and high – if the values reach ≥ 8.

Data collection and analysis / Statistical analysis

The basic descriptive statistical parameters calculated for the variables applied in the research are: arithmetic mean (X), standard deviation (SD), bottom and peak limit of the span within which the results range (Min-Max), variability coefficient (KV%), Skewness symmetry (Skew), Kurtosis of the distribution (Kurt), as well as the Kolmogorov-Smirnov test (KS). Due to the research requirements, one-factor analysis (ANOVA) and multivariant analysis of the variance (MANOVA) were applied as well as the non-parametric test of χ^2. The total processing is conducted by the statistical package of SPSS for Windows.

Table 1. KIDMED questionnaire and index according to Torun N.T., & Yildiz Y. (2013)

KIDMED questionnaire and Index	**Scoring**
Consume fruit or fruit juice every day	+1
Consume fruit a second time every day	+1
Consume fresh or cooked vegetables every day	+1
Consume fresh or cooked vegetables more than once a day	+1
Consume fish regularly (at least 2-3 times a week)	+1
Consume fast food> 1 / week (hamburger)	-1
Consume legumes> 1 / week (lentils, beans, peas)	+1
Consume pasta or rice almost every day (5 or > 5 / week)	+1
Consume cereals or seeds (bread) for breakfast	+1
Consume nuts (at least 2-3 / week)	+1
Use olive oil	+1
Skips breakfast	-1
Consume dairy products for breakfast (yogurt, milk, etc.)	+1
Consume commercially produced pastries for breakfast	-1
Consume 2 yogurts and / or cheese (40g) per day	+1
Consume sweets and cakes several times a day	-1
KIDMED index: weak ≤ 3; optimal 4-7; high ≥ 8	

Results

1. Basic descriptive statistical parameters of the variables

The basic descriptive statistical parameters were calculated for all the variables, as follows: arithmetic mean (X), standard deviation (SD), bottom and peak limit of the span within which the results range (Min-Max), variability coefficient (KV%), Skewness symmetry (Skew), Kurtosis of the distribution (Kurt), as well as the

Kolmogorov-Smirnoff test (KS) with which the normality of distribution is tested. The results of these respondents according to their diagnoses are presented in Tables from 2 to 4.

The inspection of Table 2 reveals that the Skewness-values of all variables about the respondents' group with diagnose of cerebral tumor are within the limits of recommended values from -1 to +1, which indicates that the results' distribution is approximately symmetric. The Kurtosis-values suggest that the respondents' group with the diagnose of cerebral tumor have an indication of flatness (platykurtic distribution) with all of the applied variables.

The homogeneity of the respondents' group with the cerebral tumor diagnose is at a satisfactory stage regarding the calculated coefficients of variability. The highest homogenic level is noticed with the body height (CV= 4,64), whereas the highest level of results' dispersion is marked with the variable of 'daily number of smoked cigarettes' (CV= 102,86).

The results of the Kolmogorov-Smirnov procedure indicate that all the variables of the respondents' group with cerebral diagnose are normally distributed.

Table 2. Basic descriptive statistical parameters of the applied variables with the respondents' group of cerebral tumor diagnose

Variables	Mean	Min	Max	SD	CV%	Skewn	Kurto	K-S
Age	62,43	40,00	80,00	12,95	20,74	-0,53	-0,59	p>.20
Height	1,66	1,57	1,76	0,08	4,64	0,17	-1,92	p>.20
Weight	77,43	60,00	95,00	12,40	16,02	0,15	-1,49	p>.20
How many cigarettes per day	7,14	0,00	20,00	7,35	102,86	0,53	-0,84	p>.20
KIDMED Index	4,71	3,00	6,00	1,20	25,55	-0,59	-1,19	p<.15

The inspection of Table 3 shows that the Skewness values of all variables of the respondents' group with the diagnose of cardiac ischemia are within the limits of the recommended values from -1 to +1, which indicates that the distribution of results is approximately symmetrical. The Kurtosis values show that all the applied variables with the respondents' group of cardiac ischemic diagnose indicate flatness (platykurtic distribution).

The inspection of Table 3 shows that the variability coefficient of most variables with the respondents' group of the cardiac ischemia diagnose exists on a satisfactory stage. A greater dispersion of the results (greater than 30%) is noticed only with the variable 'number of smoked cigarettes per day' (CV= 85,51).

The Kolmogorov-Smirnov procedure results suggest that all the variables of the respondents' group with the diagnose of cardiac ischemia are normally distributed.

Table 3. Basic descriptive statistical parameters of the applied variables with the respondents' group of the cardiac ischemia diagnose

Variables	Mean	Min	Max	SD	CV%	Skewn	Kurto	K-S
Age	50,33	42,00	60,00	7,25	14,41	0,39	-1,65	p>.20
Height	1,71	1,58	1,82	0,08	4,86	-0,21	-0,73	p>.20
Weight	72,67	60,00	90,00	13,12	18,06	0,49	-1,73	p>.20
How many cigarettes per day	5,83	0,00	12,00	4,99	85,51	-0,11	-1,91	p>.20
KIDMED Index	7,83	7,00	9,00	0,94	11,97	0,38	-1,93	p<.20

The inspection of Table 4 shows that the Skewness values of most variables with the respondents' group of the colon cancer diagnose are within the limits of recommended values from -1 to +1, which suggests that the distribution of results is approximately symmetrical. A negative symmetry (hypokurtic) is indicated with the variable of Body height (Sk=-1,14). The Kurtosis values show that all the variables applied with the respondents' group with the colon cancer diagnose indicate flatness (platykurtic distribution).

Table 4. Basic descriptive statistical parameters of the variables applied with the respondents' group of the colon cancer diagnose

Variables	Mean	Min	Max	SD	CV%	Skewn	Kurto	K-S
Age	64,00	50,00	73,00	8,07	12,61	-0,73	-0,52	p>.20
Height	1,70	1,56	1,78	0,07	4,33	-1,14	0,61	p>.20
Weight	73,83	60,00	89,00	12,01	16,26	0,00	-1,78	p>.20
How many cigarets per day	4,00	0,00	12,00	4,71	117,74	0,73	-0,87	p<.20
KIDMED Index	7,00	6,00	8,00	0,85	12,18	0,00	-1,65	p>.20

The homogeneity of the respondents' group with the colon cancer diagnose is at a satisfactory level, having as a basis the calculated coefficients of variability. The highest level of homogeneity is noticed with the variable of Body height (CV= 4,33), whereas the highest level of results' dispersion is marked with the variable 'number of smoked cigarettes per day' (CV= 117,74).

The Kolmogorov-Smirnov procedure results indicate that all the variables with the respondents' group of the colon cancer diagnose are normally distributed.

2. Differences between the groups concerning their age, anthropometric measures, number of smoked cigars per day and KIDMED Index

This subchapter provides analysis of the research results following the aim to give an answer to the basic research problem, namely what differences exist within the variables between the three groups of respondents (patients with diagnosed cerebral tumor, cardiac ischemia and colon cancer). The analysis of the significant differences is established in three ways:

1. By a multivariant analysis of the variance (MANOVA), the quantitative differences between the respondents' groups are established in the total system of variables;
2. By the one-factor univariant analysis of variance (ANOVA), the quantitative differences between the respondents' groups are established on the basis of each variable separately;
3. By a post-hoc analysis, the quantitative differences are established between each group separately for the variables in which previously statistically significant differences were established through the one-factor univariant analysis of the variance (ANOVA).

With the use of multivariant analysis of the variance (MANOVA), namely through testing the significance of the differences in the arithmetic means for the system of variables between the three respondents' groups of different diagnoses (patients with diagnosed cerebral tumor, cardiac ischemia and colon cancer) a statistically significant difference was established (Table 5). Since Wilks' Lambda is 0,17, and it is df=10 and 62 for the freedom levels, it gives a statistically significant level of Q=.000. The size of partial effect of the determinant (partial n^2) shows high values ,585.

Table 5. Differences in the age, anthropometric measures, daily number of smoked cigarettes and KIDMED Index between the groups of different diagnoses of diseases

	Value	F	Hypothesis df	Error df	Sig.	n^2
Wilks' lambda	0,17	8,72	10	62	,000	,585

Variables	Tumor Cerebra (1)		Ischemic heart disease (2)		Colon cancer (3)		F	Sig.	n^2
	Mean	SD	Mean	SD	Mean	SD			
Age	62,43	12,95	50,33	7,25	64,00	8,07	6,88	**,003**	,28
Height	1,66	0,08	1,71	0,08	1,70	0,07	1,77	,185	,09
Weight	77,43	12,40	72,67	13,12	73,83	12,01	0,52	,600	,03
How many cigars per day	7,14	7,35	5,83	4,99	4,00	4,71	0,92	,409	,05
KIDMED Index	4,71	1,20	7,83	0,94	7,00	0,85	32,94	**,000**	,65

In order to establish in which variables there are statistically significant differences between the groups of different diagnoses, the univariant analyses of the variance were calculated for each variable. The review of Table 5 shows that there are statistically significant differences in 2 of total 5 variables. Intergroup differences are established in the following variables: age (F= 6,88; p= ,003) and KIDMED Index (F= 32,94; p= ,000). The partial effect of the determinant partial - n^2 is ranged between ,28 and ,65 and shows a middle to high effect of influence. The greatest effect in determination of differences shows the variable of KIDMET Index (partial - n^2 =.65). In order to establish those respondents' groups of different diagnoses between which there were statistically significant differences, the post-hoc tests (LSD - least significant difference test) was applied in each variable where statistically significant differences were established by the one-factor analysis (ANOVA). The tests' analyses are presented in Tables 6 and 7 and Figures 1 and 2.

Table 6. LSD post-hoc tests of the variable age between the three groups of patients (1 – cerebral tumor, 2 – cardiac ischemia and 3 – colon cancer)

Age	Mean Difference (I-J)	Std. Error	Sig.[b]
1. Tumor Cerebra - 2. Ischemic heart disease	12,095*	3,919	**,004**
2. Ischemic heart disease - 3. Colon cancer	-13,667)*	4,067	**,002**

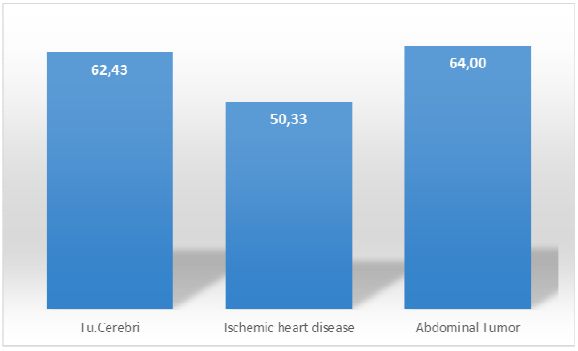

Figure 1. Review of arithmetic means of the variable of age

The arithmetic mean values and the statistical significance level of the Post-hoc test (Table 6 and Figure 1) show that those of the group diagnosed with cardiac ischemia are approximately younger in comparison with those of the groups diagnosed with cerebral tumor and colon cancer and the differences are significant on the level ,004 between the first and second group and ,002 between the second and third group. Between the groups diagnosed with cerebral tumor and colon cancer there are not statistically significant differences established in the variable of age.

Table 7. LSD post-hoc tests of the variable KIDMED Index
(1 – cerebral tumor, 2 – cardiac ischemia, 3 – colon cancer)

KIDMED Index / Diagnose	Mean Difference (I-J)	Std. Error	Sig.[b]
1. Tumor Cerebra - 2. Ischemic heart disease	-3,119)*	,402	**,000**
1. Tumor Cerebra - 3. Colon cancer	-2,286)*	,402	**,000**

The values of the arithmetic means and the level of statistical significance of the Post-hoc test (Table 7 and Figure 2) indicate that, although the value of KIDMED Index is within the frame of the optimal values, the group diagnosed with cerebral tumor still has approximately lower values of KIDMED Index (4,71) in comparison with the groups of diagnosed cardiac ischemia (7,83) and colon cancer (7,0). The differences between the first and second, and between the first and third groups are statistically significant at the level ,00, whereas between the groups of diagnosed cardiac ischemia and colon cancer statistically significant differences are not established in the KIDMED Index.

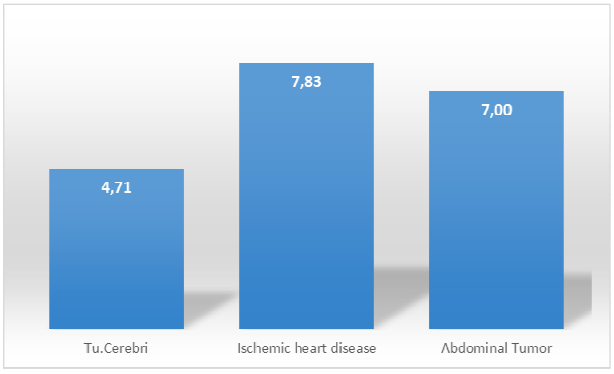

Figure 2. Review of the arithmetic mean of the KIDMED Index variable

3. Proportional differences between the groups of different diagnosed diseases and KIDMED Index

Aiming to obtain additional information, the total sample of respondents (patients) is classified in three categories according to the values obtained from the questionnaire of assessing the Mediterranean diet (Table 8), as follows: the group of high KIDMED Index (≥ 8 points in total), the group of optimal KIDMED Index (4- 7 points in total) and the group of low KIDMED Index (≤ 3 points in total).

The processing of data is completed by contingency tables on the base of the χ^2 test values and the coefficients of the contingency, as well as testing of their differences. The contingency tables are constructed by crossing the variables of assessing for KIDMED Index (in rows – horizontally), numerically by frequencies (f)

and by percentage (%) on one hand and, on the other hand, the respondents' group with different diagnoses (patients of diagnosed cerebral tumor, cardiac ischemia and colon cancer) also by the frequencies (f) and percentage (%).

Table 8. Proportional differences between the groups with different disease diagnoses and KIDMED Index

		KIDMED Index			Total
		High	Optimal	Weak	
Type of Illness	Colon cancer	2	10	0	12
		16,7%	83,3%	0,0%	100,0%
	Ischemic heart disease	6	6	0	12
		50,0%	50,0%	0,0%	100,0%
	Tumor Cerebra	0	10	4	14
		0,0%	71,4%	28,6%	100,0%
Total		8	26	4	38
		21,1%	68,4%	10,5%	100,0%

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	15,69	4	**,003**
Likelihood Ratio	18,47	4	**,001**
N of Valid Cases	38		

The analysis of Table 8 and inspection of the χ^2 test for the whole sample of respondents ((χ^2 = 15,69, p = .003) indicate that there are statistically significant differences in the KIDMED Index between the groups of different diagnoses (patients of diagnosed cerebral tumor, cardiac ischemia and colon cancer). The percentage values show the following with the group of diagnosed colon cancer: 16,7% have a high KIDMED Index, 83,3% have an optimal KIDMED Index and 0,0% have a low KIDMED Index. The group diagnosed with cardiac ischemia demonstrate: 50,0% have a high KIDMED Index, 50,0% have an optimal KIDMED Index and 0,0% have low KIDMED Index. The group diagnosed with cerebral tumor is analyzed as follows: 0,0% have high KIDMED Index, 71,4% have optimal KIDMED Index and 28,6% have low KIDMED Index. This confirms the previously obtained results about the fact that the group diagnosed with cerebral tumor have the greatest percentage of patients with a low KIDMED Index.

We believe that apart from the KIDMED Index and smoking, the values which are of great importance for the research are also those of BMI of all the patients, having in mind the fact that the obesity is related to cardiac diseases and even to some types of cancer diseases.

Table 9. BMI values of the three groups of patients

Diagnose	N	AS	SD	MIN	MAX
BMI of cerebral tumor	14	28,00	2,70	22,31	30,67
BMI of cardiac ischemia disease	12	24,56	2,43	20,76	27,47
BMI of colon cancer	12	25,41	2,73	21,26	29,74

The BMI values presented in Table 9 indicate that the patients with cerebral tumor have the greatest average values of BMI (28,00), which falls in the range of excessive body mass (overweight). The patients of colon cancer have the average value of BMI=25,41, which is a value slightly over the normal and also falls into the range of overweight, whereas the only patients with the average value of BMI=24,56, which is within the frame of normality, are those of cardiac ischemia diagnose.

Discussion

In spite of the fact that the selected sample of respondents is small (patients of different diagnoses), the analysis results suggest that most variables have a normal distribution of their results, which serves as basis to draw the conclusion that the degree of normality of the distribution with the applied variables satisfies the required methodological and statistical criteria about the use of multivariate and univariant statistical methods which are appropriate and justified for further processing of the obtained data. Besides, it has provided grounds for fairly exact scientific statement, analyzing and comparing the results.

Our attention is focused on the correlation of the Mediterranean diet, smoking and BMI (Body Mass Index) with the occurrence of some diseases, because they might have influence in triggering the three diseases considered in the present study, although these diseases can be caused by other factors as well.

The Mediterranean diet is one of the healthiest types of food-habits because, according to Silver eco (2020). Greece and Italy are the countries with the greatest percentage of aged people (people with long life expectance) (of 26% each in the 2000 year) and according to the United Nations (2019), the country with the largest aging population is Japan - with 42% out of the world's population aged 60 and above - and as many as 70.000 one-hundred-year-old people (Japan is not among the Mediterranean, but their diet is alike).

According to Willet, W. (2006), eating fruits and vegetables (which are highly present in the Mediterranean diet) can reduce the occurrence of cancers for 32%, and death caused by them – for 20-42%. Merra, G., et all. (2021) insist that that type of diet can prevent the occurrence of heart diseases and some cancer as well as the diabetes and it is believed to be the healthiest eating-habit, since people implementing it are of the longest life-expectance (Italy, Greece, Japan, Spain). Also, according to Graff-Radford, J. (2021), the Mediterranean diet improves the brain and cognitive functions, postpones the loss of memory as well as the occurrence of dementia and Alzheimer's disease and these positive results are due to improving blood circulation. Our study reveals that 1/3 or 28,6% of the patients with cerebral tumor have a low KIDMED Index, whereas 2/3 or 71,4% have optimal one. Although there are no statistically significant differences between the three groups of patients in the daily number of smoked cigarettes, yet the greatest number of smoked cigarettes per day is recorded with the group of cerebral tumor – approximately 7,14 cigarettes and maximum up to 20 cigarettes per day.

According to Barak, Y.,&Fridman, D. (2017), that type of diet has its preventive effect on the formation of digestive cancers because of the consumption of fruits, vegetables and legumes, which, apart from giving the feeling of satiety, are necessary for forming the intestinal content which, on its part, leads to reducing constipation problems and prevents the cause of colon cancer. All the same, our research revealed that 83,3% of the patients with colon cancer have an optimal KIDMED Index, and 16,7% - high. According to Hu, J., et all. (2007), the consummation of fruits, vegetables and whole-grain foods has a preventive effect only on the formation of distal colon cancer, but not on those types that appear in the upper parts of the colon. The possible reason for the increased number of cases of that type of cancer can be the increased and regular eating of red meat and fats (Potter, J.D., 1996), and also reduced consumptions of legumes, eggs and alcohol (Hu, J.F., et all., 1991) which are not taken into consideration in the research. The patients of that group smoke average only 4 cigarettes a day – the least of all the respondents' groups and up to 12 cigarettes maximum. According to Jacobson, J.S., et all. (1994), however, the risk of colon cancer is higher with smokers.

According to Martinez-Gonzales, M.A., Gea, A.,&Ruiz-Canela, M. (2019), the Mediterranean diet positively influences the cardiovascular health as well as the ischemic diseases of the heart and heart attack (Rosato, V., et all., 2019; Whayne, T.F., 2014). It is a result of the reduced eating of "bad" fats (above all foods of animal origin and those rich in saturated fats and cholesterol), whereas the raised consumption of "healthy" fats, omega 3, omega 6 fatty acids and above all consumption of olive oil cause reduction of the cholesterol level and atherosclerosis of the blood vessels and through that the high blood pressure is reduced as well, along with heart diseases and even the stroke. What is more, de Lorgeril, M., et all. (1999) give even more precise notice that the Mediterranean diet can keep heart safe up to 4 years after a heart attack. Our research shows that 50% of the patients with cardiac ischemia have a high KIDMED Index and 50% - optimal one. The patients of this group smoked average 5,8 cigarettes and 12 cigarettes maximum, which can be a cause for provoking the disease in relatively young persons - with the average age of 50 years, since smoking leads to atherosclerosis and poor blood-circulation and at the end heart disease and stroke .

Obesity is a factor that also relates to cardio diseases (Katta N., et all. 2020), to diabetes (Mokdad, A.H., et all., 2001), and even to some types of cancers (CDC/National center for health statistics, 2016). That is why, we think that those values which are above the normal for the patients with cerebral tumor (BMI = 28,00) and colon cancer (BMI=25,41) might influence the formation of the diseases. However, the value of BMI=24,56 with patients of cardiac ischemia does not logically support the early formation of the disease, particularly because 50% of the patients have a high, and 50% - optimal KIDMED Index. This is the group in which the patients have the least daily number of smoked cigarettes, which suggests that there might be some other factors to influence the formation of the disease, which have not be taken into consideration (genes, stress, alcohol consumption and others).

Conclusion

On grounds of the performed research, we can draw the following conclusions:

- The group with the cardiac ischemic disease are the youngest of all patients, having the approximate age of 50 years when the disease appeared, whereas the oldest patients – of 64 years – are those with the colon cancer;
- There are statistically significant differences in the KIDMED Index between the groups of different diagnoses (patients with a cerebral tumor, cardiac ischemia and colon cancer);
- Large percentage of patients with cerebral tumor diagnose have low KIDMED Index, although 71,4% of them have optimal index, but the average value of this index in this group (4,7) is the lowest in the three groups. That means that the patients with cerebral tumor are oldest and the same time 28,6% of

them have low KIDMED Index. Maybe the highest BMI of patients in this group (BMI=28) play a role as the most smoked cigarettes a day in this group (average 7,14 cigarettes a day);

- The largest percentage of the patients with a cardiac ischemic disease have equally of the high (50%) and optimal KIDMED Index (50%), with the average value of the index 7,8 (the best in the three groups), which means that they are aware of the importance of nutrition and the good food choices. Also the average BMI in this group is 24,56, which is in normal rang and they smoked 5,8 cigarettes on a daily basis. This means that some other factors influence the early onset of cardiac ischemic disease that were not take into consideration, like lack of physical activity, genetics, alcohol consumption or something else;
- The largest percentage of the patients with colon cancer have optimal (83,3%) and high KIDMED Index (16,7%). Their average BMI is 25,5 which means overweight and they smoke average 4 cigarettes a day (lowest number in all three groups). So this means that also in this group there are factors that influence the occurrence of this disease that were not taken into consideration;

Conflicts of interest - We don't have any conflicts of interest to declare.

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