

SOME ANTHROPOLOGICAL CHARACTERISTICS OF ADULT POPULATION OF THE NORTHWEST BAČKA

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ABSTRACT. Vojvodina is a region situated in the north of Serbia and Montenegro and the south east part of the Pannonian Plain. Because of its good geographic position, relief, hydrographic characteristics and climate, this region has had the interesting past full of different racial, language, cultural and ethnic groups. Today there are 41 ethnic groups in Vojvodina, the largest ones being Serbs (65%), Hungarians (14.28%), Slovaks (2.79%) and Montenegrins (1.75%). This paper analyses Serbs, Montenegrins and Hungarians, native and newcomers in four rural locations in the North West Backa. The investigation included 279 males and 367 females, all over 20 years of age. The analysis included height, leg and arm length, chest circumference, waist and hip circumference and body mass from which BMI and WHR indexes were obtained. The smallest values of longitudinal characteristics, chest and hip circumference have been recorded in Hungarians of both sexes. In males, newcomers are recorded to have higher values of all of the examined characteristics, particularly height, leg length and body mass. As for female newcomers, higher averages of all characteristics have been recorded, except waist circumference. Males are mostly overweight while females are normally nourished. The distribution of WHR index shows that a great number of males are with higher health risk. Ethnic group and homeland of the subjects do not influence the size of circumference characteristics, although their influence is present in the longitudinal characteristics of height and leg length.

KEY WORDS. anthropological characteristics, adult population, Northwest Bačka

INTRODUCTION

Anthropological characteristics give an insight into body build and physical appearance of human populations. A large number of studies have focused on

investigation of human traits and variability and pointed to the influence of ethnic and socio-cultural characteristics on biological structure of certain population.

The Northwest Bačka is situated in the north of Serbia and Montenegro and the Province of Vojvodina. Bačka is the biggest continual plain situated between the rivers Danube and Tisa and Hungarian border. Due to its good geographic position Vojvodina has always attracted many of the nations with different ethnic, religious, cultural, social and anthropological characteristics. According to the last census, today in Vojvodina there are 2.031 992 inhabitants belonging to 41 ethnic groups. The largest among them are Serbs (65%), followed by Hungarians (14.28%), Slovaks (2.79%), Montenegrins (1.75%), Rumanians (1.50%), Roma (1.43%), Bunjevci (0.79%) etc.

According to Vlahovic (2004) in present population of Vojvodina Serbs represent the oldest ethnic group. They are followed by Hungarians who settled in this region after the liberation from Turks, together with Slovaks. Among other much smaller ethnic groups, Serbs and Hungarians are the oldest ethnic layer, so called natives, who represent 54% of the whole population, according to the last census. (Republički zavod za statistiku 2003). A large number of Vojvodina population are newcomers who came to this region from different parts of former Yugoslavia after First, and particularly Second World War.

Members of these different ethnic groups that live on rather small territory of the Province of Vojvodina have managed to preserve their cultural and anthropological characteristics. Nevertheless, living in the same place has created a symbiosis among different populations. This mingling has been restricted by geographic distances and limitations caused by religious beliefs and ethnic belonging. Greater influences have been recorded between Hungarians and Slovaks, Slovaks and Serbs, Serbs and Rumanians, Serbs and Hungarians, Bulgarians and Hungarians (Vlahović 1994, 2004).

According to the words of a Serbian highly respected scholar J. Cvijić (1966) „...in those places where natives and newcomers from different countries have mingled, the old provincial or historical national type vanishes and a new ethnic amalgam appears. Since there have been different immigration streams in certain areas, different regional types of population have emerged there.“ Ethnic diversity is the real treasure of Vojvodina and as such offers large possibilities for anthropological investigations. The anthropological investigations of adult population of Vojvodina have focused on the changes of morphological characteristics with ageing (Gavrilović and Božić 1981), as well as the influence of ethnic group belonging on manifestation of differences in morpho-physiological characteristics. It has been determined that newcomers are of greater height than natives (Gavrilović 1960a,b), Montenegrin newcomers being tallest (Božić 1976). Newcomers are also qualified with greater leg and arm length (Pavlica 1996). Investigating native males in Bačka, Gavrilović (1963) has concluded that they are above average height, normally nourished with quite large rib cage. In adult population of Fruška Gora (Gavrilović 1978) the means of Rohrer's index are greater in natives of all age groups. In females, smaller differences between natives and newcomers have been

recorded. In following investigations (Pavlica 1996) it has been determined that male newcomers have greater body mass than male natives while in females no significant differences have been observed.

The aim of the paper is to determine anthropological characteristics, nourishment and distribution of fat tissue in adult population of Northwest Bačka.

MATERIAL AND METHOD

An anthropological investigation was conducted in summer and autumn 2004 following the instructions of International Biological Program (IBP) and World Health Organization (WHO). The investigation was conducted by transversal, i.e. cross sectional method using original Martin anthropological apparatus (Siber Hegner Switzerland). The subjects were 279 males and 367 females who live in the northwest Bačka, in villages Mali Idoš, Lovćenac, Sivac and Crvenka.

The villages Mali Idoš and Lovćenac are situated on the motorway Belgrade – Subotica, while Sivac and Crvenka are to the west of these places. The population of Mali Idoš is mainly Hungarian (87%) that came here in Austro-Hungarian period from the village Szent András, Békés District (Hungary). In other places, apart from natives, there is a significant percentage of newcomers who arrived after Second World War, particularly between 1946 and 1952. The population mainly emigrated from Montenegro, and in smaller number from other parts of former Yugoslavia: Bosnia, Dalmatia, Lika, Kosovo and Croatia. According to the national structure, Montenegrins are the largest group in Lovćenac (56.86%), while Serbs are the largest group in Sivac (57.60%) and Crvenka (71.47%).

The morphological characteristics that were examined are the following: height, leg and arm length, chest circumference, waist and hip circumference and body mass. From these the body mass index (BMI) and waist to hip ratio (WHR) were obtained.

The data were processed in relation to the sex, ethnic group and homeland. Data processing was done using standard statistic method, univariant analysis of variance ANOVA, t-test, factor and multiple regressive analysis. According to ethnic group belonging, the analysis included Serbs, Hungarians and Montenegrins. As for their homeland, the subjects were analyzed as natives and newcomers. The group of natives included Serbian and Hungarian population whose grandparents were born in Vojvodina. The group of newcomers consisted of people whose ancestors migrated to Vojvodina.

RESULTS

Table 1 shows statistical indicators of anthropological characteristics of the Northwest Bačka population. It can be observed that the average age of males equals 43.35. The average height equals 174.78cm and ranges from 156.5cm to 199.9cm. The average leg length is 100.12cm and arm length is 77.68cm. The variability coefficients of the above traits approximately equal 5%, thus pointing to the homogeneity of the sample. The middle chest circumference equals 104.89cm, which indicates that it is well developed. The waist and hip circumference equal 97.71cm

and 102.59cm, respectively. The body mass ranges from 51.5kg to 138.0kg. The univariant analysis of variance ANOVA indicates statistically significant differences only for the height and leg length of the examined males.

In females, the average age is 42.58. The average height equals 162.38cm and ranges from 140.0cm to 179.0cm. The leg length is 96.80cm and the arm length 70.75cm. The circumference measures are more variable. The body mass variability is also present and ranges from 40.00kg to 122.0kg, the average being 68.79kg. ANOVA indicates that statistically significant differences among the examined females are present in longitudinal traits.

TABLE 1. Anthropological characteristics of adult population in Northwest Backa

	Age	Body height	Leg length	Arm length	Chest circum.	Waist circum.	Hip circum.	Body weight
		(cm)	(cm)	(cm)	(cm)	(cm)	(cm)	(kg)
MALES								
N	279	279	279	279	279	279	279	279
X	43.35	174.78	100.12	77.68	104.89	97.71	102.59	83.32
SD	10.85	7.23	5.30	3.77	9.82	12.40	8.29	14.44
MIN	18.01	156.50	73.00	64.40	74.00	71.00	80.00	51.50
MAX	68.53	199.00	113.00	89.00	142.00	139.00	132.00	138.00
KV	25.02	4.14	5.29	4.85	9.37	12.69	8.08	17.33
F		5.197*	5.686**	2.215	1.281	0.728	0.619	2.352
		f=0.01	F=5.49			f=0.05	F=3.35	
FEMALES								
N	367	367	367	367	367	367	367	367
X	42.58	162.38	96.80	70.75	95.72	83.02	104.10	68.79
SD	10.73	6.36	4.55	3.47	10.52	12.17	10.35	12.36
MIN	15.94	140.00	79.50	58.50	9.80	62.00	81.00	40.00
MAX	69.52	179.00	109.80	85.30	127.00	123.00	139.00	122.00
KV	25.19	3.91	4.70	4.915	11	14.66	9.95	17.96
F		4.712*	3.988*	3.612*	1.362	1.034	1.089	1.219
		f=0.01	F=5.49			f=0.05	F=3.35	

* p<0.05

** p< 0.01

Table 2 shows statistical indicators of anthropological characteristics of males in relation to their ethnic group. It is observed that the examined groups differ in their longitudinal measures. The smallest values are recorded in Hungarians. As for height and leg length, significant differences are recorded between Montenegrins and Hungarians (p<0.01) and Serbs and Hungarians (p<0.01). The difference in arm length is observed only between Serbs and Hungarians (p<0.01). In relation to the three circumference measures and body mass, greatest values are recorded in Montenegrins, while statistically significant differences are observed only in the body mass of Montenegrins and Hungarians (p<0.01).

TABLE 2. Anthropological characteristics of males in relation to their ethnic group

	Age	Body height (cm)	Leg length (cm)	Arm length (cm)	Chest circum. (cm)	Waist circum. (cm)	Hip circum. (cm)	Body weight (kg)
SERBS								
N	91	91	91	91	91	91	91	91
X	43.18	176.20	101.57	78.47	104.36	96.79	102.61	83.28
SD	10.29	6.90	5.44	3.80	9.60	12.99	8.27	14.20
MIN	18.01	161.50	73.00	68.00	84.00	71.00	88.00	56.00
MAX	65.64	199.00	113.00	88.00	133.00	133.00	129.00	138.00
KV	23.83	3.91	5.36	4.85	9.20	13.42	8.06	17.05
HUNGARIANS								
N	104	104	104	104	104	104	104	104
X	43.64	172.42	98.30	76.99	104.05	97.48	102.14	80.86
SD	10.98	7.00	4.63	3.59	9.97	12.74	8.63	14.74
MIN	21.97	157.30	82.50	67.90	84.00	72.00	85.50	51.50
MAX	68.53	189.50	110.50	87.00	142.00	139.00	132.00	117.00
KV	25.17	4.06	4.71	4.67	9.58	13.07	8.45	18.24
MONTENEGRINS								
N	82	82	82	82	82	82	82	82
X	43.24	176.33	100.85	77.73	106.63	99.16	103.30	86.74
SD	11.33	7.18	5.36	3.82	9.80	11.28	7.91	13.81
MIN	19.52	156.50	85.60	64.40	74.00	77.00	80.00	62.00
MAX	61.77	189.00	112.50	89.00	136.00	130.00	127.00	132.00
KV	26.21	4.07	5.31	4.91	9.19	11.38	7.65	15.93

In females, (Table3) Montenegrins are recorded to have the greatest and Hungarians the smallest values of longitudinal measures. As for the height, significant differences are observed in all three ethnic groups ($p < 0.01$, $p < 0.05$). Significant difference relating to the leg and arm length is observed between Montenegrins and Hungarians ($p < 0.01$), as well as Serbians and Hungarians ($p < 0.01$; $p < 0.05$). Speaking of circumference dimensions and body mass, greatest values are observed in Serbian females. However, statistically significant difference appears only in relation to the chest circumference between Serbians and Hungarians ($p < 0.05$).

TABLE 3. Anthropological characteristics of females in relation to their ethnic group

	Age	Body height (cm)	Leg length (cm)	Arm length (cm)	Chest circum. (cm)	Waist circum. (cm)	Hip circum. (cm)	Body weight (kg)
SERBS								
N	115	115	115	115	115	115	115	115
X	43.72	163.13	97.58	71.00	97.66	84.13	105.10	70.45
SD	9.68	5.89	4.15	3.21	9.40	11.72	10.45	11.76
MIN	19.53	148.80	88.30	64.30	80.00	66.00	82.00	45.00
MAX	62.16	177.60	109.80	83.20	127.00	120.00	136.00	106.00
KV	22.13	3.61	4.25	4.52	9.63	13.94	9.94	16.69
HUNGARIANS								
N	145	145	145	145	145.00	145	145	145
X	41.95	160.63	95.48	69.95	94.80	83.02	103.80	67.67
SD	10.71	6.39	4.35	3.40	9.26	11.71	9.98	12.63
MIN	17.04	140.00	82.10	58.50	77.00	63.00	81.00	40.00
MAX	69.52	179.00	107.70	78.30	122.00	117.00	139.00	122.00
KV	25.53	3.98	4.56	4.86	9.77	14.10	9.61	18.68
MONTENEGRINS								
N	95	95	95	95	95	95	95	95
X	41.71	164.58	98.03	71.79	95.89	81.89	103.89	69.18
SD	11.83	5.97	4.79	3.57	9.77	13.44	10.73	12.66
MIN	15.94	150.30	79.50	61.90	80.00	62.00	88.00	50.00
MAX	59.46	177.00	109.00	85.30	121.00	123.00	135.00	106.00
KV	28.36	3.63	4.88	4.97	10.18	16.41	10.33	18.29

Table 4 offers statistical indicators relating to the males' homeland. It is observed that newcomers are qualified with higher values in all of the examined characteristics, with statistical significance recorded only for the height ($p < 0.01$), leg length ($p < 0.01$) and body mass ($p < 0.05$).

TABLE 4. Anthropological characteristics relating to the males homeland

	Age	Body height (cm)	Leg length (cm)	Arm length (cm)	Chest circum. (cm)	Waist circum. (cm)	Hip circum. (cm)	Body weight (kg)	Body mass index kg/m^2	WHR
NATIVES										
N	150	150	150	150	150	150	150	150	150	150
X	43.96	173.36	99.29	77.49	103.99	97.19	102.12	81.33	26.99	0.95
SD	10.32	6.99	4.69	3.73	9.64	12.53	8.17	14.37	4.07	0.06
MIN	21.97	157.30	82.50	67.90	84.00	71.00	85.50	51.50	18.02	0.76
MAX	68.53	199.00	112.50	88.00	142.00	139.00	132.00	138.00	38.53	1.10
KV	23.48	4.03	4.73	4.81	9.27	12.89	8.00	17.67	15.11	7.06
NEWCOMERS										
N	127	127	127	127	127	127	127	127	127	127
X	42.75	176.37	101.06	77.83	105.85	98.17	102.98	85.48	27.48	0.95
SD	11.48	7.22	5.83	3.79	10.02	12.27	8.36	14.25	4.27	0.07
MIN	18.01	156.50	73.00	64.40	74.00	74.00	80.00	56.00	19.32	0.79
MAX	65.64	193.00	113.00	89.00	136.00	133.00	129.00	132.00	40.76	1.28
KV	26.85	4.09	5.77	4.87	9.46	12.50	8.12	16.67	15.52	7.74

As for females, (Table 5) higher averages are observed in newcomers in relation to all of the characteristics, except the waist circumference. Statistically significant differences are recorded only in longitudinal dimensions. The values of t-test for the height, leg length and arm length are statistically significant ($p < 0.01$).

TABLE 5. Anthropological characteristics relating to the females homeland

	Age	Body height (cm)	Leg length (cm)	Arm length (cm)	Chest circum. (cm)	Waist circum. (cm)	Hip circum. (cm)	Body weight (cm)	Body mass index kg/m ²	WHR
NATIVES										
N	182	182	182	182	182	182	182	182	182	182
X	42.39	161.12	95.99	70.14	95.46	83.31	103.98	67.99	26.21	0.80
SD	10.45	6.45	4.39	3.33	9.72	12.09	10.11	12.57	4.72	0.06
MIN	17.04	140.00	82.10	58.50	77.00	63.00	81.00	40.00	18.15	0.64
MAX	69.52	179.00	107.70	78.30	127.00	120.00	139.00	122.00	42.08	0.98
KV	24.65	4.01	4.58	4.75	10.18	14.52	9.72	18.49	18.03	7.72
NEWCOMERS										
N	178	178	178	178	178	178	178	178	178	178
X	43.09	163.58	97.59	71.33	95.94	82.76	104.13	69.44	26.00	0.79
SD	10.88	6.13	4.64	3.58	11.41	12.28	10.56	12.03	4.52	0.06
MIN	15.94	148.80	79.50	61.90	9.80	62.00	82.00	45.00	16.73	0.65
MAX	62.16	177.60	109.80	85.30	125.00	123.00	136.00	106.00	39.66	0.95
KV	25.26	3.75	4.75	5.02	11.89	14.84	10.14	17.33	17.37	7.52

The results of factor analysis referring to the total male sample stress two main factors that explain 88.97% of the space variance. The first of these refers to the circumference measures among which the waist circumference is of the greatest influence. The second one refers to longitudinal dimensions, with leg length being the most influential. The multiple regressive analysis has shown that ethnic group belonging and homeland are of no great influence to the waist circumference ($F=1.027 < f_{0.05}$) but they are influential to the leg length ($F=5.61 > f_{0.05}$).

Two main factors that explain 88.7% of the space variance are also distinguished in females. As it is the case with males, in the first case it is the waist circumference, while in the second case it is the height. The multiple regressive analysis has shown that ethnic group belonging and homeland are of no great influence to the waist circumference ($F=0.348 < f_{0.05}$), while their influence is more present in the height ($F=5.449 > f_{0.05}$).

TABLE 6. Categorization of Body Mass Index in relation to ethnic groups - males

Category	SERBS		HUNGARIANS		MONTENEGRINS		TOTAL	
	N	%	N	%	N	%	N	%
moderate			1	0.96			1	0.96
underweight								
normal	34	37.36	36	34.61	20	24.39	90	32.49
weight								
overweight	41	45.05	39	37.5	36	43.90	116	41.88
obesity	15	16.48	28	26.92	26	31.71	69	24.91
pathological	1	1.09					1	1.09
obesity								

TABLE 7. Categorization of Body Mass Index in relation to ethnic groups - females

Category	SERBS		HUNGARIANS		MONTENEGRINS		TOTAL	
	N	%	N	%	N	%	N	%
medial					2	2.10	2	
underweight								
moderate	2	1.74	4	2.76	3	3.16	9	2.53
underweight								
normal	44	38.26	59	40.69	45	47.37	148	41.69
weight								
overweight	46	40	56	38.62	29	30.53	131	36.90
obesity	22	19.13	25	17.24	16	16.84	63	17.75
pathological	1	0.87	1	0.69			2	0.56
obesity								

Table 6 and 7 shows the categorization of Body Mass Index in relation to ethnic groups of both sexes. In males, the highest percentage of the overweight is observed in all three ethnic groups. As for females, the highest percentage is recorded as normally nourished, exception being Serbians who are mostly overweight. In relation to their homeland, the highest percentage of native and newcomer males (Table 8) is overweight, while females (Table 9) are mostly normally nourished. The results of WHR (Table 10) are also in compliance with the obtained data for BMI. Distribution of WHR values for natives and newcomers do not differ. In males, 48% of people are with the index greater than 0.95, which points to the presence of higher health risk. In females the number of those with the index being greater than 0.85% is no higher than 21%.

TABLE 8. Categorization of Body Mass Index in relation to their homeland - males

Category	NATIVE		NEWCOMERS	
	N	%	N	%
moderate underweight	1	0.67		
normal weight	51	34	39	30.71
overweight	62	41.33	53	41.71
obesity	36	24	34	26.77
pathological obesity			1	0.79

TABLE 9. Categorization of Body Mass Index in relation to their homeland - females

Category	NATIVE		NEWCOMERS	
	N	%	N	%
medial underweight			2	1.12
moderate underweight	4	2.20	4	2.25
normal weight	76	41.76	78	43.82
overweight	66	36.26	65	36.52
obesity	34	18.68	29	16.29
pathological obesity	2	1.10		

TABLE 10. Distribution of WHR values for natives and newcomers

NATIVES			NEWCOMERS	
MALES				
WHR	N	%	N	%
less 0.95	78	52	66	51.97
greater 0.95	72	48	61	48.03
FEMALES				
WHR	N	%	N	%
less 0.85	148	81.32	141	79.21
greater 0.85	34	18.68	37	20.79

DISCUSSION

The paper describes an analysis of anthropological characteristics of adult population of the Northwest Bačka. The analysis included the largest ethnic groups, Serbs, Hungarians and Montenegrins, both natives and newcomers to Vojvodina. The investigation included subjects above the age of 20, with average age being approximately 43 in both of the sexes.

The results analysis has determined that the population of the northwest Bačka, including both sexes, is of great height. The average height in males is 174.78cm and in females 162.38cm. The smallest height is recorded in Hungarians and the greatest in Montenegrins of both sexes. In males these differences are statistically significant between Montenegrins and Hungarians and also between Serbs and Hungarians. In females, Montenegrins are of greater height than Serbian women, and thus statistically significant difference is observed among all three ethnic groups. Newcomers are qualified as taller than natives, this difference being significant in both males (3.01cm) and females (2.46cm). This is in accordance with previous investigations of the population of Vojvodina (Gavrilović 1960 a,b) which focused on the height of natives and newcomers in Vojvodina. It has been observed and confirmed that newcomers of Vojvodina are of greater height than natives. This can be explained by the fact that the largest part of the examined newcomers is of Montenegrin nationality, the one that was previously determined (Božić 1976) to be of the greatest height in Vojvodina. A smaller number of the examined newcomers are from Bosnia, Dalmatia and Lika, the regions whose population is also of great height. In comparison with previous investigations (Gavrilović 1960 a,b, 1963, 1978, Božić 1976, Pavlica 1996) there has been an increase in height regarding the whole

sample, certain nationalities and their homeland. This points to acceleration, i.e. greater height and physical development that has been largely present worldwide since the end of 19th century. The sex dimorphism of height in the examined population of the Northwest Bačka equals 12.4cm, which is in accordance with differences between males and females of other populations. The sex differences in the height of natives in the Northwest Bačka equal 12.24cm, this being in complete agreement with previous results of sex dimorphism of 12.48 cm in natives (Božić 1976). As for newcomers, the difference is 12.79cm which is slightly smaller in comparison with previous investigations (Božić 1976, Pavlica 1996).

The analysis of leg length explains the portion of leg length in height in upright position. The results of this investigation indicate that the average leg length in males equals 100.12cm and in females 96.80cm. The ethnic group investigation has shown that the smallest leg length is in Hungarians of both sexes. This is not surprising since leg length is a characteristic that highly correlates with height. Significant differences are recorded between Montenegrins and Hungarians as well as Serbs and Hungarians of both sexes. As it is the case with height, newcomers are qualified with greater leg length in comparison with natives, these differences being statistically significant in both sexes. When compared with previous investigation of Vojvodina population (Gavrilović and Božić – Krstić 1981, Pavlica 1996) an increase in the leg length has also been observed. In males this difference is 8.6cm and in females it is 12.65cm.

The analysis of arm length results shows that the average equals 77.68cm in males and 70.75 cm in females. The smallest arm length is observed in Hungarians of both sexes. In males, significant difference has been recorded only between Serbs and Hungarians, while in females between Montenegrins and Hungarians, as well as between Serbians and Hungarians. Newcomers of both sexes are recorded to have longer arms than natives. This could have been expected considering that arm length is a longitudinal characteristic that highly correlates with height and leg length, the two traits already described to be greater in newcomers.

Chest circumference is a transversal measure which, together with height and body mass, is basic for estimating physical status of an individual. In the examined investigation the average value of this parameter is 104.89cm in males and 95.72cm in females. As with longitudinal characteristics, the smallest values are recorded in Hungarians. However, statistically significant differences are not recorded in males, while in females they are present only between Serbians and Hungarians. Newcomers of both sexes are recorded to have greater middle chest circumference than natives, although statistically significant differences are not observed. Comparing the obtained data with previous investigations (Gavrilović 1978), an increasing trend of this characteristic has also been observed.

The ratio of waste and hip circumference dimensions has been used for calculating WHR index that points to the fat tissue distribution. If this index exceeds 0.95 in males and 0.85 in females, there is a possibility of greater health risk since a larger portion of fat tissue accumulates in the upper part of torso. In the examined population of the Northwest Bačka, the waist and hip circumference in males equal 97.71 and 102.59cm, respectively. In females, the waist circumference is 83.02cm

and the hip circumference 104.10cm. Considering nationality, the highest values of these two characteristics are recorded in Montenegrin males and Serbian females, although no significant differences have been recorded. As it is the case with all of the above characteristics, greater values are observed in newcomers, but with no statistically significant differences. This is also observable in the distribution of WHR index values of natives and newcomers which indicates that 48% of the total male population is with an increased health risk. In females this percentage is smaller, and yet high enough to point to irregularities in the diet and life style. This is in accordance with the data referring to the nourishment level of BMI which indicates that the highest percentage of the overweight is in males of all three nationality groups. As for females, the highest percentage of them are normally nourished, the exception being Serbian females who are mostly overweight. The analysis of male natives and newcomers has determined that in both of these groups there is the highest percentage of the overweight, while females are mostly normally nourished. In previous investigations of Vojvodina population (Gavrilović 1978, Božić 1976) natives were found to have greater Body Mass Index. In this investigation as in those that followed (Pavlica 1996) no significant differences between these two groups have been recorded. This leads to the conclusion that newcomers have accepted the way of life in new living conditions.

Univariant analysis of variance has determined that males are the most heterogeneous in height and leg length while females in all three longitudinal characteristics. By factor analysis main factors that explain more than 80% of space variance have been distinguished. In males these are waist circumference and leg length while in females they are waist circumference and height. Multiple regressive analysis which includes the factors of ethnic group belonging and homeland has shown that these do not have influence on waist circumference but on two longitudinal characteristics-height and leg length.

CONCLUSION

Analyzing the obtained results it has been determined:

Adult population of the Northwest Bačka is characterized with tall stature. Males are mostly overweight while females are normally nourished. The distribution of WHR index shows that a great number of males are with higher health risk.

In comparison with previous investigations, this analysis has pointed to the acceleration of all longitudinal characteristics and middle chest circumference.

The smallest values of longitudinal characteristics, chest and hip circumference have been recorded in Hungarians of both sexes.

In males, newcomers are recorded to have higher values of all of the examined characteristics, particularly height, leg length and body mass. As for female newcomers, higher averages of all characteristics have been recorded, except waist circumference. However, the differences are significant only in longitudinal characteristics.

Ethnic group and homeland of the subjects do not influence the size of circumference characteristics, although their influence is present in the longitudinal characteristics of height and leg length.

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