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Anthropometric Indices of Obesity and Potential Health Risk in Adult Rural Population from Bačka and Banat – The Republic of Serbia

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A B S T R A C T

Obesity, along with other unhealthy living habits, nowadays represents one of the greatest risk factors for various diseases. Vojvodina is a part of Serbia where a high percentage of the overweight has been recorded since the period of former Yugoslavia. The aim of this study therefore was to determine the percentage of adults with potential health risk using the indices of obesity. The anthropological study was conducted from 2001 to 2006. The tested group consisted of 4504 individuals, 1965 men and 2539 women. The mean age of the sample was 40.61±11.29. The data were collected in 46 villages in Bačka and Banat, in the central and north-east parts of Vojvodina, situated in the north of Serbia. The investigation included the height, weight, waist and hip circumference. Nutritional condition was determined using the body mass index (BMI kg/m^2), while the waist circumference and WHR were used for assessing the central obesity. According to the average BMI (26.86 kg/m^2 males, 25.80 kg/m^2 females), the population of Bačka and Banat is characterised with pre-obesity. In total, 58.47% individuals of both sexes are with excessive body weight, 38.52% of them being classified as overweight and 19.48% as obese. Central obesity is more frequent in males aged up to 40, while in females it is more present above the age of 50. A higher waist circumference (males >94 cm; females >80 cm) is observed in 58% of males and 55% of females, with the risk value (males >102 cm; females >88 cm) recorded in 32% of men and women. The indices of obesity indicate a potential health risk for more than a half of the subjects in this study. The data therefore point to the necessity of introducing educational programs for promoting good nutrition and healthy living habits that would ultimately reduce the number of individuals with health risk.

***Key words**: body mass index, men, women, waist to hip ratio, the north of Serbia*

Introduction

Nutritional status is an important factor for assessing physical and health condition of individuals and populations. The underweight and overweight are mostly characterised by lower physical activity and endurance and are more susceptible to various health problems that affect and diminish the quality of life. Underweight condition may cause undernutrition, osteoporosis, infertility and impaired immunocompetence[1]. In developed countries, however, some of the leading health problems are overweight and obesity, usually associated with inadequate nutrition and bad living habits with insufficient physical activity.

In recent years an increased prevalence of the overweight and obese has been recorded worldwide[2]. There are about 350 million of the obese and more than 1 billion of the overweight in the world today. According to the data of Serbian Institute for Health Protection[3], more than a half of the population of Serbia (54%) has the excessive body weight, with 36.7% of them being overweight and 17.3% obese. The greatest prevalence is recorded in Vojvodina, with 35.5% of the population being overweight and 23% of them classified as obese.

Obesity is nowadays one of the leading risk factors for cardiovascular diseases, hypertension, stroke, diabetes and certain cancer types[4]. According to the official data[5], more than 46% of adult population in Serbia suffer from hypertension and 56.8% of deaths are caused by heart and blood vessel diseases. For assessing the nutritional

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status and health risks associated with excessive body weight, the World Health Organization (WHO)[2] has recommended the body mass index (BMI kg/m^2). Along with BMI, the distribution of fat tissue, i.e. the size of intra-abdominal fat tissue is also an important factor that may indicate predisposition towards cardiovascular and metabolic diseases. The waist and hip circumference and their ratio representing the index of fat tissue distribution (WHR) can be good indicators of visceral obesity and health risk[6]. Both BMI and waist circumference exhibit equally strong association with hypertension, in both men and women, and in those who are below or over 65 years of age[4]. In order to discover a potential health risk in an early stage, it is advisable to assess the fat tissue distribution, even in individuals with normal weight. Vojvodina is a part of Serbia with a high percentage of individuals with excessive body weight[7]. Therefore the aim of this study was to determine the percentage of adults with potential health risk using the indices of obesity.

Materials and Methods

An anthropological investigation of Bačka and Banat population was conducted in the period 2001–2006. This was a part of a more comprehensive study of adult population of Vojvodina that started in 1997. The tested group consisted of 4504 adult individuals, 1965 men and 2539 women. The data were collected in 46 villages in Bačka and Banat, in the central and north-east parts of Vojvodina, the north of Serbia. The area covered in the research was 18.025 km^2. The subjects voluntarily filled in questionnaires and participated in anthropometric measurements. The formula for optimal size sample was used in the calculation of each characteristic owing to the fact that this study used a simple random sample without repetition[8]. All anthropometric measurements were carried out by the same investigator using specialist GPM Anthropological Instruments for Somatology and Osteology (Siber Hegner Maschinen AG Zürich) in accordance with International Biological Programme (IBP)[9] and WHO[2]. The average age of the male and female subjects was 40.10±11.84 and 41.12±10.75, respectively. The minimum and maximum age spanned from 19.50 to 78.39 in men and from 19.51 to 77.53 in women. Table 1 presents the number of individuals by age and sex groups.

Normality of the age distribution was checked using the D Kolmogorov-Smirnov test. Since the test pointed to non-normality of the distribution, the median and centile distances ($C_{25} – C_{75}$) were used for the description of age.

The subjects were lightly dressed and without shoes and were measured in the morning hours. Body height was measured with an anthropometer in the standing erect position, to the nearest 0.1 cm. Body weight was measured on electronic digital scale with an accuracy of up to 0.1 kg. Waist circumference was measured (on the narrowest part of torso) to the nearest 1 mm at the level midway between the lower rib margin and the iliac crest at end of normal expiration. Hip circumference represents maximum posterior extension of buttocks and was measured to the nearest 1 mm at the widest point between hip and buttock. The Body Mass Index (BMI), a person's weight in relation to the height (kg/m^2), was calculated from the acquired data. The values of BMI were divided in accordance with the international classification[2]. The following categories were distinguished: underweight (BMI <18.4 kg/m^2), normal weight (BMI 18.5–24.9 kg/m^2), overweight (BMI 25–29.9 kg/m^2), obese (BMI >30 kg/m^2). The following categories were distinguished for prevalence of abdominal obesity WHR: males ≥0.95, females ≥0.85[2]. Waist circumference of 80 cm and higher, but lower than 88 cm for women and 94 cm and higher, but lower than 102 cm for men was considered as an increased health risk (regardless of BMI). Waist circumference of 88 cm and higher for women and 102 cm and higher for men was considered as a high health risk. Potential health risk was determined on the basis of both of the traits, i.e. waist circumference and BMI, and the categorization complied with Canadian Guidelines for Body Weight Classification in Adults[1] (Table 2).

TABLE 1
THE NUMBER OF INDIVIDUALS BY AGE AND SEX GROUPS

	20–29	30–39	40–49	50–59	>60
Males	473	468	532	409	83
Females	447	617	848	567	60

TABLE 2
HEALTH RISK CLASSIFICATION ACCORDING TO BODY MASS INDEX AND WAIST CIRCUMFERENCE

Waist Circumference	BMI – Categories		
	18.5–24.9	25–29.9	30–34.9
males: <102 cm females: <88 cm	Least risk	Increased risk	High risk
males: >102 cm females: >88 cm	Increased risk	High risk	Very high risk

Measurements were analysed with the use of the program SPSS for Windows version 10 using standard statistical methods. The prevalence of overweight, obesity and increased waist circumference were expressed as percentages with 95% confidence intervals (95% CI). The age and sex differences related to the prevalence of obesity, central obesity and health risk were estimated using chi-square test. One-factor analysis of variance (ANOVA) was applied to determine the differences in the mean BMI, WHR and waist circumference among the age groups. Statistical significance of the differences was checked by a Post-hoc test with LSD-method, the level of significance being $p<0.01$. Gender differences within the age categories were checked by Student's t-test, with the level of significance $p<0.01$.

All applicable institutional and governmental regulations concerning the ethical use of human volunteers were followed during this research.

Results

Table 3 shows mean values of anthropometric indices and prevalence of overweight, obesity and abdominal obesity in different age groups of males and females. The average BMI of adult males (26.86 kg/m^2) indicates that a considerable number of these subjects are overweight. The smallest average BMI is observed in youngest subjects, while in other age groups it approximately equals 27 kg/m^2. Significant difference in the average values appears only in two youngest ages ($p<0.01$), while in other ages no significant differences are observed. In female subjects, the average BMI of the total sample is lower than this is the case with males (25.80 kg/m^2) but at the same time higher than the normal value, indicating that a considerable of females are also overweight. Female subjects of different age exhibit different BMI ($p<0.01$), the values increasing linearly with age. Till the age of 50, men have significantly higher BMI than women, while after this age BMI demonstrates the opposite trend, with significantly higher values recorded in women.

Waist circumference increases with age in both of the sexes. In men, significant differences are observed in younger age groups, till the age of 50 ($p<0.01$), while in women they are observable among all age groups ($p<0.01$). In all age groups men exhibit a significantly higher waist circumference than women ($p<0.01$). The averages greater than the normal values are recorded in men older than 30 and women older than 40.

The average index of abdominal obesity (WHR) increases significantly with age in both sexes, with men exhibiting significantly higher values than women in all ages ($p<0.01$).

In total the largest percentage of males are classified as overweight (45.09%), while 21.23% of them are obese. The greatest percentage of normal weight males is recorded only in youngest age group (53.48%). In all other age groups the prevailing percentage of male subjects are overweight. The percentage of subjects with excessive weight increases with age, but differences in the prevalence of overweight men are not statistically significant until the age of 50. The largest percentage of overweight men appear in the age 50–59, this group showing statistical difference in relation to two youngest age groups ($p<0.01$).

Obesity is least present at the age 20–29 (9.30%), while from the age of 30 it is observable in more than 20% of subjects. Most frequently obesity is present at the age of 40–49 (27.26%).

In females, overweight is present in 32% of the total subjects, while the percentage of the obese is smaller than in males (17.73%). The percentage of the overweight and obese women increases with age. Till the age of 50, women are mostly of normal weight, this trend decreasing with aging. From the age of 50 onwards, most of the females are overweight and obese. This number culminates in the oldest age group with 90% of the subjects being either overweight or obese. Statistically significant differences related to the incidence of overweight and obese women are recorded among all age groups ($p<0.01$), with an exception of the two oldest age groups. This might be a result of a relatively small sample of women belonging to the age group >60 years. Considering the incidence of the overweight and obese subjects, gender differences are present till the age of 50, with higher incidence recorded in men ($p<0.01$). In women, a higher percentage of the obese is observed after the age of 50, but in comparison with men, this is not significantly different.

Analysing the total sample it can be observed that WHR >0.95 in 42.70% of males, which points to a considerable percentage of subjects with central obesity. The largest percentage of women (78%) are with normal fat tissue distribution. The percentage of males with WHR >0.95 and females of WHR >0.85 increases with age and the differences among age groups are statistically significant ($p<0.01$).

The results referring to central obesity based on the waist circumference are much more alarming since they indicate that 58% of males and 55% of females are with excessive waist circumference. In addition, the percentage of subjects with health risk increases with age.

As for central obesity, it is more present in males up to the age of 40 ($p<0.01$), while after the age of 50 it more frequently appears in female subjects. However, when compared to men, these differences are not significant.

BMI and waist circumference point to the existence of both obesity and central obesity which further implies[1] that health risk should be assessed on the basis of both of the two indicators. Figure 1 shows the health risk categories based on these two indicators refering to the total male sample and age categories.

It is noticeable that in the total sample 33.79% of males are with least health risk, while 66.20% of individuals are with potential risk due to the increased waist circumference, overweight, or combination of both of these factors. The analysis of different age groups shows that the lowest health risk appears in youngest subjects, while increased, high and very high health risk become more dominant as the age increases.

Although lower than in males, the total number of females with health risk (Figure 2) is also rather high (51.35%). The frequency of a potential health risk increases with the age of subjects and statistically significant differences in the frequency of categories with a health risk are noticable among all age groups ($p<0.01$), except for two groups of women of the oldest age. Until the age of 50, men are of a greater health risk than women ($p<0.01$). In the age group 50–59 years, there is a similar percentage of subjects with a possible health risk in both sexes (78.48% of men and 76.06% of women). The

TABLE 3
$\overline{X}$ VALUES OF ANTHROPOMETRIC INDICES AND PREVALENCE OF OVERWEIGHT, OBESITY AND ABDOMINAL OBESITY IN DIFFERENT AGE GROUPS OF MALES AND FEMALES

	20–29 ($\overline{X}$=24.84)		30–39 ($\overline{X}$=34.87)		40–49 ($\overline{X}$=44.47)		50–59 ($\overline{X}$=53.04)		>60 ($\overline{X}$=61.47)		Total	
Males												
Characteristic		95% CI		95% CI		95% CI		95% CI		95% CI		95% CI
BMI (kg/m²)	25.04	24.72–25.36	26.82	26.44–27.20	27.57	27.24–27.90	27.92	27.56–28.28	27.69	26.90–28.48	26.86	26.68–27.04
Waist circumference (cm)	89.64	88.67–90.62	95.75	94.67–96.83	98.61	97.65–99.58	100.79	99.75–101.82	101.34	99.08–103.61	104.40	103.91–104.88
WHR	0.88	0.88–0.89	0.93	0.92–0.94	0.95	0.95–0.96	0.98	0.97–0.98	0.99	0.97–1.00	0.94	0.93–0.94
Prevalence of overweight (BMI 25–29.9 kg/m²)(%)	37.84	33.57–42.11	43.38	38.89–47.87	45.68	41.46–49.90	53.30	48.37–58.23	51.81	40.27–63.35	45.09	42.89–47.29
Prevalence of obesity (BMI >30 kg/m²) (%)	9.30	6.74–11.86	21.80	18.06–25.54	27.26	23.49–31.03	25.43	21.12–29.74	26.51	16.31–36.71	21.23	19.42–23.04
Prevalence of abdominal obesity WHR >0.95 (%)	13.95	10.90–17.00	35.90	31.55–40.25	50.94	46.71–55.17	66.01	61.33–70.69	77.11	67.41–86.81	42.70	40.51–44.89
First stage W >94 cm	19.03	15.58–22.48	25.64	21.68–29.60	26.88	23.13–30.63	27.87	23.44–32.30	38.55	27.31–49.79	25.39	23.47–27.31
Second stage W >102 cm	13.74	10.71–16.77	28.63	24.53–32.73	39.10	34.97–43.23	46.21	41.28–51.14	43.37	31.92–54.82	32.16	30.10–34.22

Females

	20–29 ($\overline{X}$=24.83)		30–39 ($\overline{X}$=34.74)		40–49 ($\overline{X}$=44.31)		50–59 ($\overline{X}$=53.22)		>60 ($\overline{X}$=61.69)		Total	
BMI (kg/m²)	22.75	22.42–23.08	24.49	24.16–24.83	26.56	26.25–26.86	28.10	27.74–28.47	29.61	28.56–30.67	25.80	25.62–25.98
Waist circumference (cm)	74.70	73.83–75.58	79.89	79.03–80.75	84.81	84.03–85.59	89.86	88.86–90.86	95.03	92.36–97.71	91.90	91.38–92.42
WHR	0.76	0.76–0.77	0.79	0.79–0.80	0.81	0.8–0.81	0.83	0.83–0.84	0.86	0.85–0.87	0.80	0.80–0.81
Prevalence of overweight (BMI 25–29.9 kg/m²)(%)	12.98	9.97–15.99	24.47	21.08–27.86	37.78	34–53–41.03	40.86	36.68–45.04	41.67	28.64–54.70	31.95	30.14–33.76
Prevalence of obesity (BMI >30 kg/m²) (%)	5.37	3.35–7.39	10.21	7.82–12.60	20.42	17.72–23.12	29.27	25.40–33.14	48.33	35.12–61.54	17.73	16.24–19.22
Prevalence of abdominal obesity WHR >0.85 (%)	7.16	4.85–9.47	14.42	11.65–17.19	23.11	20.29–25.93	37.57	33.45–41.69	58.33	45.30–71.36	22.25	20.53–23.87
First stage W >80 cm	12.75	9.76–15.74	23.50	20.15–26.85	28.30	25.28–31.32	22.22	18.69–25.75	18.33	8.10–28.56	22.80	21.17–24.43
Second stage W >88 cm	9.40	6.78–12.02	18.80	15.72–21.88	34.79	31.60–37.98	55.55	51.33–59.77	75.00	63.56–86.44	32.02	30.21–33.83

CI – confidence interval

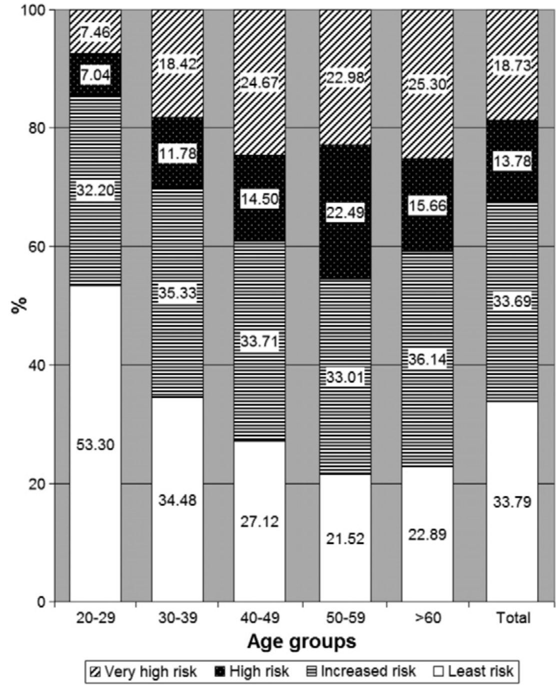

Fig. 1. Health risk groups in relation to waist circumference and BMI – males.

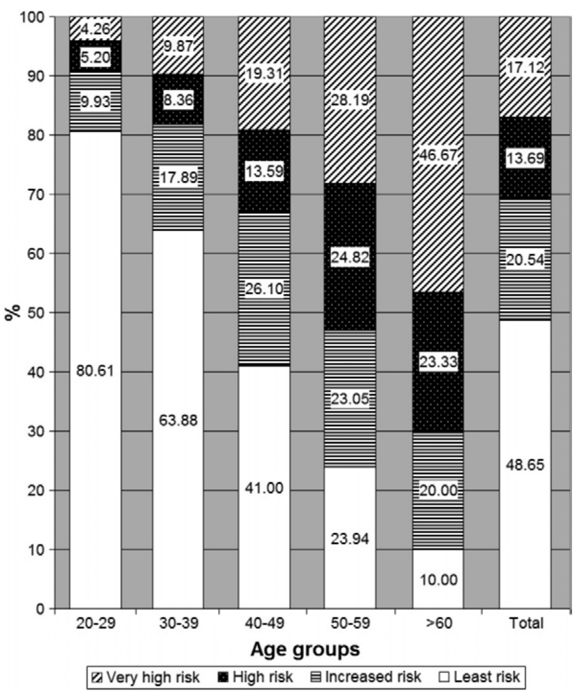

Fig. 2. Health risk groups in relation to waist circumference and BMI – females.

exception is the oldest age category where women appear to be more susceptible to a health risk than males. This, however, is of no statistical significance.

Discussion

The study of anthropometric indices of obesity and a potential health risk was conducted in rural parts of Bačka and Banat, the two regions where agriculture is by far the main industry owing to their geographic position and the richness of soil. The investigated subjects live in areas with very similar social structure. The majority of them have secondary school diplomas and do not differ significantly in their level of education.

According to the results of the present study, the problem of overweight and obesity appears to be more common among males (66.32%) than females (49.68%), a phenomenon also observed in recent studies in Croatia[10]. In the population sample of Bačka and Banat the average number of subjects with excessive weight, both male and female, equals 58.47%. In the case of 38.52% of these individuals overweight problem is observed, while in other 19.48% of the cases obesity is present. In comparison with the data refering to Vojvodina and presented by Serbian Institute for Health Protection[3] (overweight 35.5%; obesity 23%), a higher percentage of the overweight and a smaller number of the obese is observed. A study conducted in the city of Novi Sad[11] has pointed to a greater percentage of overweight (51.85% males and 36.70% females) and obesity, particularly in females (28.41%). These results, however, refer to subjects of older average age (56.30 years). A similar frequency of overweight and obesity is reported in recent studies in Croatia[10] stating that over 60% of men and 50% of women have an excess body weight. It was found that 20.1% of men and 20.6% of women aged over 18 in Croatia are obese. Cardiovascular risk factors research in Bosnia and Herzegovina[12] points to a greater percentage of the overweight (males 48.4%; females 35.9%) as well as a larger percentage of obese women (25%) than it is the case with the present results. The reported percentage of the obese men (16.5%), however, is smaller than in the sample from Bačka and Banat. Compared with the data of WHO[13] refering to some European countries, Canada and America, the present results imply that the rural population of Bačka and Banat is at the top of the list of European countries with highest percentage of the overweight and obese.

In males obesity is most frequently present at the age of 40–49 while in females from the age of 50 onwards, most of the females are overweight and obese. This number culminates in the oldest age group with 90% of the subjects being either overweight or obese.

Results of our and other studies confirm the increase of BMI, WHR and waist circumference with age[14]. Aging is associated with low demand for energy caused by the decrease of basic metabolism and lack of physical activity. On the basis of distribution of WHR categories and waist circumference, a considerable number of subjects are determined to have central obesity. The results referring to central obesity based on the waist circumference indicate that 58% of males and 55% of females are with excessive waist circumference. In the case of 32% of subjects, the excessiveness of this trait indicates a very high health risk (W >102 cm for males; W >88 cm for females). The prevalence of central obesity increases with age of both sexes. Until the age of 40, men exhibit a noticeably greater prevalence than this is the case with women. This, however, changes with the age of 50 and onwards, when the prevalence is higher in women, but this difference is of no statistical significance. In women, the age of 50 and above is crucial for body composition changes since this is the age of menopause. After menopause, insufficiencies of estrogens play a significant role in the change of body composition and changes of adipose tissue[15].

Investigations conducted in Croatia[16] on adults aged 18 years or older, report a similar central obesity prevalence (W >102 cm for males; W >88 cm for females) in males (34.98%), and greater in females (51.13%), when compared with the sample from Bačka and Banat.

In compliance with Canadian Guidelines for Body Weight Classification in Adults[1], health risk categorization has been determined on the basis of waist circumference and BMI, since these two traits are indicators of both obesity and central obesity. As this study used the above classification, it restricted only to obese individuals whose BMI ranged from 30 to 34.9 kg/m^2. However, it should be emphasized that individuals with BMI 35–39.9 have very high risk and person with BMI 40+ have extremely high risk regardless of their WC.

The analysis of health risk indicates that, according to the anthropometric indices of obesity, a considerable percentage of both men and women are with a potential health risk. Gender differences are noticeable in the distribution of categories with a health risk. These results comply with previously reported data[17] which have pointed that the prevalence of the risk factors in various age groups is different in women when compared with men. During the second and third decade of life incidence of CVD is twice higher in man compared to female, and women usually suffer from cardiovascular diseases ten years later in their life then men. During fertile period they are partially protected but later, the risk increases after menopause, partly because of ovarian hormone deficiency that favors central obesity, hypertension, diabetes, hyperlipidemia, and the metabolic syndome. Analysing the subjects older than the age of 60, potential health risk is more frequent in women than in men, but the difference is not statistically significant. This complies with earlier data[17] claiming that in the seventh decade of life, the incidence of CVD is practically the same in both sexes.

Although restricted to a part of the rural population of Bačka and Banat, this study offers an insight into the nutritional status and a potential health risk among rural population in Vojvodina today. It should be stated that according to WHO[2] the weight classification system can be applied to draw comparisons of body weight patterns and health risks between populations. However, such comparisons should be interpreted with caution because the BMI or WC may not correspond to the same level of risk in different populations. The influence of other factors, such as ethnicity or race, may result in differences between populations in the prevalence of disease associated with each BMI category[2]. It is important to note that the risk for an individual will be influenced by a unique combination of factors which must be considered in addition to BMI and/or WC[18]. It is also important to note that BMI does not reflect weight history. Recent weight gains or weight losses may be associated with health risks independent of BMI categorization and require assessment in individuals[19]. Accordingly, cardiovascular diseases may also be a result of certain biological factors, such as inheritance, age or sex, whose effects cannot be changed. There are also other factors, such as insufficient physical activity, stress or smoking, and their effects can be modified by a change of lifestyle.

The results of anthropometric index of obesity in a sample of rural population of Bačka and Banat demonstrate that more than a half of the subjects are under a potential health risk. Since the average age of the subjects is 40.61±11.29 years, these results seem to be rather alarming. In order to reduce the number of individuals with certain diseases and those with a potential health risk, it is important to monitor the frequency of certain risk factors in human populations. This implies a constant need of assessing body traits and the index of obesity in order to offer the official information in public on the number of individuals with real and potential health problems.

The information derived from body weight surveillance and associated health risks can help guide health policy decisions and also serve as a component in the evaluation of population-based intervention programs.

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REFERENCES

1. HEALTH CANADA, Canadian guidelines for body weight classification in adults (Ottawa: Minister of Public Works and Government services, Canada, 2003). Available from: URL: http://www.he-sc.gc.ca/fn-an/nutrition/weights-poids/guide-ld-adult/cg_quick_ref-lde_rapide_ref_e.html. — 2. WORLD HEALTH ORGANIZATION (WHO): Obesity: Preventing and Managing the Global Epidemic (Report of a WHO Consultation on Obesity, 2000). — 3. MINISTARSTVO ZDRAVLJA REPUBLIKE SRBIJE, Gojaznost: Nacionalni vodič za lekare u primarnoj zdravstvenoj zaštiti (Republička stručna komisija za izradu i implementaciju vodiča u kliničkoj praksi, Ministarstvo zdravlja republike Srbije, 2004). — 4. IVIČEVIĆ UHERNIK A, MUSIĆ MILANOVIĆ S, Coll Antropol, 33 (2009) 75. — 5. MINISTARSTVO ZDRAVLJA REPUBLIKE SRBIJE, Uredba o Nacionalnom programu, prevencije lečenja i kontrole kardiovaskularnih bolesti u Republici Srbiji do 2020. godine, Službeni glasnik Republike Srbije, 11 (2010). — 6. SKRZYPCZAK M, SZWED A, PAWLINSKA CHMARA R, SKRZYPULEC V, Anthropological Review, 70 (2007) 3. — 7. GRUJIĆ V, MARTINOV CVEJIN M, AČ NIKOLIĆ E, DRAGNIĆ N, MIJATOVIĆ JOVANOVIĆ V, KVRGIĆ S, TRAVAR S, Vojnosanit Pregl, 66 (2009)

705. — 8. STOJKOVIĆ HM, Osnove medicinske statistike (Viša medicinska škola u Ćupriji, 2005). — 9. WEINER JS, LOURIE JA, Human biology; a guide to field methods, International biological programme (Blackwell scientific publications, 1969). — 10. MUSIĆ MILANOVIĆ S, IVIČEVIĆ UHERNIK A, FIŠTER K, Coll Antropolo, 33 (2009) 67. — 11. SRDIĆ B, STOKIĆ E, Glasnik Antropološkog društva Srbije, 43 (2008) 398. — 12. VASILJ I, PILAV A, MASLOV B, POLAŠEK O, Coll Antropol, 33 (2009) 185. — 13. WORLD HEALTH ORGANIZATION (WHO): Global Info Base. Available from: URL: http://who.int/infobase. — 14. JAKOVLJEVIĆ Đ, PLANOJEVIĆ M, ur. Dvadeset godina MONICA projekta u Novom Sadu (Institut za kardiovaskularne bolesti Sremska Kamenica i Dom zdravlja Novi Sad, 2005). — 15. SKRZYPCZAK M, SZWED A, J Comp Hum Biol, 56 (2005) 141. — 16. FIŠTER K, KOLČIĆ I, MUSIĆ MILANOVIĆ S, KERN J, Coll Antropol, 33 (2009) 25. — 17. EUROPEAN HEART NETWORK, Women and Cardiovascular Research in Europe, Red Alert for Women's Hearts, Available from: URL: http://www. ehnheart.org/publications/annual-reports. — 18. NATIONAL INSTITUTES OF HEALTH, NATIONAL HEART, LUNG AND BLOOD INSTITUTE, Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults (The Evidence Report. 1998. NIH Publication No. 98-4083). — 19. WORLD HEALTH ORGANIZATION (WHO), Physical Status: The Use and Interpretation of Anthropometry (Report of a WHO Expert Committee, 1995).

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ANTROPOMETRIJSKI INDEKSI PRETILOSTI I POTENCIJALNI ZDRAVSTVENI RIZIK KOD ODRASLOG RURALNOG STANOVNIŠTVA BAČKE I BANATA – REPUBLIKA SRBIJA

S A Ž E T A K

Pretilost udružena sa lošim životnim navikama danas predstavlja jedan od vodećih faktora rizika za razvoj mnogih bolesti. Vojvodina je dio Srbije koji je još u staroj Jugoslaviji mjerio visoki postotak pretilih osoba. Zbog toga je cilj ovog rada pomoću indeksa pretilosti utvrditi postotak odraslih osoba koje bi potencijalno mogle biti pod zdravstvenim rizikom. Antropološko istraživanje stanovništva je izvršeno u periodu od 2001. do 2006. godine. Ukupno je ispitano 4504 osobe, 1965 muškaraca i 2539 žena. Prosječna starost uzorka je bila 40,61±11,29. Istraživanje je provedeno u 46 ruralnih naselja Bačke i Banata, u centralnim i sjeveroistočnim delovima Vojvodine, koja se nalazi na sjeveru Srbije. Izmjereni su visina i masa tijela, obujam struka i kukova. Stanje uhranjenosti je utvrđeno indeksom tjelesne mase (BMI kg/m^2) a centralna pretilost preko obujma struka i WHR. Prema prosječnim vrijednostima BMI (muškarci 26,86 kg/m^2; žene 25,80 kg/m^2) stanovništvo Bačke i Banata spada u kategoriju predgojaznih. U prosjeku 58,47% osoba oba spola ima problem prekomjerne uhranjenosti, pri čemu je 38,52% sa prekomjernom uhranjenošću dok je pretilih 19,48%. Muškarci imaju sve do 40-te godine nešto veću učestalost centralne pretilosti, a žene nakon 50-te godine. Ukupno 58% muškaraca i 55% žena ima povišene vrijednosti obujma struka (muškarci ≥94 cm; žene ≥80 cm), dok je rizično povećan (muškarci ≥102 cm; žene ≥88 cm) kod 32% muškaraca i žena. Indeksi pretilosti ukazuju da više od polovine ispitanih muškaraca i žena može biti pod potencijalnim zdravstvenim rizikom. Stoga je potrebno informirati i educirati stanovništvo o značaju pravilne prehrane i usvajanju zdravih životnih navika, kako bi se broj osoba sa zdravstvenim rizikom u budućnosti smanjio.