



Anthropometric Parameters as Indicators of Obesity in Adolescents in Montenegro

Ivan VASILJEVIC

Dept. of Physical Culture, Faculty for Sport and Physical Education, University of Montenegro, Podgorica, Montenegro

***Correspondence:** Email: vasiljevic.ivan301@gmail.com

(Received 17 Aug 2018; accepted 23 Aug 2018)

Dear Editor-in-Chief

Obesity today presents a common chronic health problem that lowers quality of life and significantly affects morbidity and overall mortality (1). Global prevention of overweight and obesity in children increased from 4.2% in 1990 to 6.7% in 2010 and is expected to reach 9.1% by 2020 (2). Being obese in childhood is a serious risk factor for the development of obesity in adulthood, which affects the general state of health of an individual, by increasing the risk of developing diabetes, hypertension, coronary arthritis and metabolic syndrome (3).

The aim of the research was to determine the level of obesity in adolescents in Montenegro by the means of several indicators, as well as to compare the results with research conducted in other populations. Level of nutrition was also assessed by other indicators, such as waist-to-height ratio (WHtR) and body fat percentage (body fat %).

The population in this study was made of adolescents aged 14-18 yr with their place of residence on the territory of Montenegro, while the sample of respondents was organized by combining and stratifying, so that various properties and different areas of the mentioned population were processed. The total sample of respondents comprised of 1,449 adolescents from the secondary schools in Montenegro, and the research included all three regions in Montenegro. The people who were taking measures were qualified for this job

with anthropometric training before they were allowed to work with research participants. Informed consent was taken from the participants before the study.

The criteria for exclusion from the research were as follows: student refusal, medical conditions such as severe genetic diseases (e.g. Down syndrome or Marfan syndrome), severe hormone disorders, diseases leading to swelling of the subcutaneous tissue, diseases leading to loss of muscle mass, metabolic bone diseases and taking drugs that could affect the body mass index.

As indicated in the results of the research, obesity in male adolescents for all regions in Montenegro amounts to 15.2%, while in female adolescents the obesity reaches 9.7%. Analyzing the results of obesity in adolescents in other populations in Europe (4), Slovakia (8%), Russia (9%), Czech Republic (9%), Netherlands (11%), Poland (12%), Germany (13%), Denmark (17%), Bulgaria (17%), Croatia- Zagreb (20%), Great Britain (21%), Spain (21%), Greece-Thessaloniki (22%) and Cyprus (23%), it is clear that obesity in Montenegro also slowly becomes a problem of modern era, especially concerning male adolescents and adolescents living in the northern and central regions in Montenegro. When it comes to adolescents in Poland in Krakow (5) 15.6% of males and 13.4% of females are obese. In Spain (6), obesity in adolescents amounts to 25.6% for boys and 19.1% for girls. In Arab countries (7)

obesity among adolescents is a problem that is troubling and disturbing (in Kuwait men 60.4% and women 41.4%), United Arab Emirates - Sharjah city (38.9% men, women 20.2%) and Jordan - Amman (men 31.8%, women 22.1%). The increase in overweight and obesity is also present in school age, and research results show 21% of obesity rate in India in Bangalore (8). When it comes to children in Japan the percentage of obesity is lower and amounts to 5.8% (9), while in South Africa the percentage of obese children amounts to 5.7% (10).

Obesity in adolescents in Montenegro is increasingly present and identifies with other countries in Europe. The percentage of obesity is higher in male population and it is more frequent in the northern and central regions than in the southern, suggesting that beside hypokinesia, which is the primary cause of obesity, reduced and balanced diet is also of great importance.

Conflict of Interest

The authors declare that there is no conflict of interests.

References

1. Pavlica T, Bozic-Krstic V, Rakic R, Sakac D (2012). Prevalence of overweight and obesity in adult rural population of the northern part of Backa and Banat. *Vojnosanit Pregl*, 69(10): 833–839 [In Serbian].
2. De Onis M, Blössner M, Borghi E (2010). Global prevalence and trends of overweight and obesity among preschool children. *Am J Clin Nutr*, 92(5): 1257–64.
3. Aronne LJ, Segal KR (2002). Adiposity and fat distribution outcome measures: assessment and clinical implications. *Obes Res*, 10 (1): 14S–21S.
4. Lobstein T, Frelut ML (2003). Prevalence of overweight among children in Europe. *Obes Rev*, 4:195–200.
5. Klimek-Piotrowska W, Koziej M, Holda MK et al (2015). Anthropometry and Body Composition of Adolescents in Cracow, Poland. *PLoS One*, 10(3): e0122274.
6. Moreno LA, Mesana MI, Fleta J et al (2005). Overweight, obesity and body fat composition in Spanish adolescents. The AVENA Study. *Ann Nutr Metab*, 49: 71–76.
7. Musaiger AO, Al-Mannai M, Tayyem R et al (2012). Prevalence of Overweight and Obesity among Adolescents in Seven Arab Countries: A Cross-Cultural Study. *J Obes*, 2012:981390.
8. Kuriyan R, Thomas T, Lokesh DP et al (2011). Waist circumference and waist for height percentiles in urban South Indian children aged 3–16 years. *Indian Pediatr*, 48:765–771.
9. Hara M, Saitou E, Iwata F, Ikada T, Harada K (2002). Waist-to-height ratio is the best predictor of cardiovascular disease risk factors in Japanese schoolchildren. *J Atheroscler Thromb*, 9:127–132.
10. Motswagole BS, Kruger HS, Faber M, van Rooyen JM, de Ridder JH (2011). The sensitivity of waist-to-height ratio in identifying children with high blood pressure. *Cardiovasc J Afr*, 22:208–211.