

An assessment of nutritional status of young men – students and regular soldiers

Anna Kłos¹, Jerzy Bertrandt¹, Wiesława Szymańska², Roman Łakomy¹,
Anna Kęska³, Małgorzata Sobczak³

¹Department of Hygiene and Physiology, Military Institute of Hygiene and Epidemiology, Warsaw, Poland.

²Department of Health, the Ministry of Internal Affairs, Warsaw, Poland.

³Department of Biology, University of Physical Education, Warsaw, Poland.

Author's address:

Jerzy Bertrandt, Military Institute of Hygiene and Epidemiology, Kozielska 4, 00-163 Warsaw, Poland;
phone: (+48) 22 685 31 34, 601 853 117, e-mail: J.Bertrandt@wihe.waw.pl

Received: 2012.12.21 • Accepted: 2013.03.13 • Published: 2013.03.30

Summary:

Introduction: Obesity is currently a great epidemiological problem worldwide. Although obesity has been associated with a man for a long time, nowadays it is pandemic of obesity that is visible, and the diseases associated with it have become the leading cause of death. The causes of obesity are inconsistent. Incorrect diet and low physical activity are mentioned the most frequent as the causes of obesity.

Material and methods: The aim of this study was to assess the nutritional status of students of selected higher education institutions: The Main School of Fire Service (SGSP), Maria Skłodowska-Curie University of Warsaw, (UWMSC) and the National School of the Pope John Paul II in Biała Podlaska (PSWBP) as well as regular soldiers under the age of 30 years, serving in the chemical armies. The study involved the assessment of nutritional status of totally 741 young people, while 81.4% were male and 18.6% female. Assessment of nutritional status was based on the results of anthropometric measurements.

Results: The largest percentage of respondents who were diagnosed overweight and obesity concerned PSWBP students, the lowest concerned students of the first and the second year of SGSP in Warsaw. Underweight was not diagnosed among students. However, underweight was observed in 6.9% of surveyed female students of UWMSC. Overweight was found in 29.5% of female students of PSWBP and in 14.9% of the women in UWMSC, while obesity was diagnosed in 10.4% of female students of UWMSC and in 8.3% of students in PSWBP.

Conclusions: Overweight among students and soldiers is a muscle type, as proven by the low rate of obesity. Obesity and underweight among the studied population indicates unbalanced nutrition in terms of energy, which in the long run may result in the formation and development of specific diet-related diseases.

Key words: nutritional status, underweight, overweight, obesity.

Introduction

Obesity is currently a great epidemiological problem worldwide. Although obesity has been associated with a man for a long time as evidenced by excavated stone statues derived from 50 thousand years [1]. Nowadays it is pandemic of

obesity that is visible, and the diseases associated with it have become the leading cause of death. Since 1980, the worldwide number of obese has increased more than two times. In 2004, 1.4 billion adults had increased body weight, including

obese amounted to 200 million men and nearly 300 million women. In 2010, over 40 million children under 5 years of age were overweight, and 65% of all people living in countries where obesity kills more people than underweight [2]. According to data from representative national surveys conducted under the Household Food Consumption and Anthropometric Survey, in 2000, obesity was present in 41% of men and 28.7% of women. The prevalence of obesity was estimated to be 15.7% among men and 19.9% among women. This issue affects all age groups, regardless of age, gender and race.

Positive energy balance is always the cause of obesity, i.e. the energy value of food intake exceeds energy loose associated with the maintenance of basal metabolic rate and energy loose for activity and recreation [3]. The causes of obesity are inconsistent. Incorrect diet, low physical activity and genetic predisposition are among the most frequent causes. Statistics show increase in obesity, especially at a young age, which makes it necessary to monitor the occurrence of this phenomenon, particularly among young people [4].

In Poland, young people between 19 and 25 years of age take higher education. This time is special, because it is spent away from home by some young people, often in a completely different environment. A poorly balanced diet and low physical activity are the main cause of the development of obesity later in life [5]. Among the factors that have a significant impact on overweight and obesity one mentions, in addition to errors of dietary, genetic factors, low physical activity, socio-economic factors, concomitant diseases and medications [6,7,8]. The aim of this study was to assess the nutritional status of students of selected higher educations institutions: The Main School of Fire Service (SGSP), Maria Skłodowska-Curie University of Warsaw (UWMSC) and the National School of the Pope John Paul II in Biała Podlaska (PSWBP) as well as regular soldiers under the age of 30 years, serving in the chemical armies.

Material and methods

The study involved the assessment of nutritional status of totally 741 young people, while 81.4% were male and 18.6% female. Assessment of nutritional status was based on the results of

anthropometric measurements, such as height and weight. These parameters form the basis of the calculation of body mass index (BMI). The obtained values allowed to classify the respondents according to Ferro-Luzzi classification [9] to groups of protein-energy malnutrition ($BMI \leq 18.4 \text{ kg/m}^2$), normal ($18.5 \geq BMI \leq 24.9 \text{ kg/m}^2$), overweight ($25.0 \geq BMI \leq 29.9 \text{ kg/m}^2$), and showing evidence of obesity ($BMI \geq 30.0 \text{ kg/m}^2$).

Results

The average age of studied young males was 23.3 ± 2.7 years. The youngest group consisted of students of the first and the second year of SGSP (19.7 ± 1.1 years), and the oldest—chemical armies soldiers (25.6 ± 2.3 years). The average height and weight of the respondents amounted to 179.1 ± 6.4 cm and 79.4 ± 10.2 kg. The average lean body mass-BMI was $24.7 \pm 2.9 \text{ kg/m}^2$ and was in the normal range; however, in the students of the first and the second year of UWMSC, the third year of PSWBP and chemical armies soldiers BMI values exceed accepted standards, indicating the occurrence of obesity (Table 1).

Table 1: Basic anthropometric indicators of studied young men

Higher education institute	Age [years]	Height [cm]	Body mass [kg]	Body Mass Index (BMI) kg/m^2
SGSP I and II year	$19,7 \pm 1,1$	$180,5 \pm 5,8$	$77,0 \pm 7,4$	$23,6 \pm 1,9$
UWMSC I and II year	$25,3 \pm 4,6$	$178,3 \pm 7,9$	$80,0 \pm 14,3$	$25,1 \pm 4,2$
SGSP III year	$21,3 \pm 1,0$	$180,4 \pm 5,7$	$79,2 \pm 8,6$	$24,2 \pm 2,2$
PSWBP III year	$24,8 \pm 4,6$	$178,7 \pm 6,2$	$80,4 \pm 9,4$	$25,3 \pm 3,3$
Chemical armies soldiers	$25,6 \pm 2,3$	$177,8 \pm 6,3$	$80,3 \pm 11,4$	$25,3 \pm 3,1$
Average	$23,3 \pm 2,7$	$179,1 \pm 6,4$	$79,4 \pm 10,2$	$24,7 \pm 2,9$

BMI indications showed that students of PSWBP constituted the highest percentage of respondents who were overweight and obese, the lowest among the students of the first and

the second year of SGSP in Warsaw. Underweight was not diagnosed among the students (Table 2).

Average age of female students ranged from 20.3 ± 2.9 years (SGSP) to 29.0 ± 7.7 years (PSWBP). The lowest increase (164.9 ± 6.6 cm) concerned female students of UWMSC, while the highest — (166.6 ± 6.1 cm) female student of SGSP. The lowest body weight was observed in SGSP female students, the highest in PSWBP female students. BMI values ranged from 21.6 ± 1.7 – 23.9 ± 4.5 kg/m² (Table 3).

Based on the BMI results underweight was observed in 6.9% of female students of UWMSC. Among SGSP female students there was no overweight and/or obesity. However, overweight was observed in 29.5% of PSWBP female students and in 14.9% of the women studying in UWMSC, while obesity was found in 10.4% of UWMSC female students and in 8.3% of PSWBP students (Table 4).

Table 2: Overweight and obesity in young men (in %)

	SGSP I and II year	UWMSC	SGSP III year	PSWBP	Chemical armies soldiers
Normal body mass $18.5 \leq \text{BMI} \leq 24.9$ kg/m ²	77,8	42,1	64,9	37,0	48,5
Overweight $25.0 \geq \text{BMI} \leq 29.9$ kg/m ²	21,7	47,4	33,8	51,9	43,3
Obesity BMI ≥ 30.0 kg/m ²	0,5	10,5	1,3	11,1	6,2

Table 3: Basic anthropometric indicators of studied female students

Higher education institute	Age [years]	Height [cm]	Body mass [kg]	Body Mass Index (BMI) kg/m ²
SGSP	$20,3 \pm 2,9$	$166,6 \pm 6,1$	$59,4 \pm 6,4$	$21,6 \pm 1,7$
UWMSC	$25,9 \pm 7,3$	$164,9 \pm 6,6$	$62,4 \pm 14,1$	$22,9 \pm 4,4$
PSWBP	$29,0 \pm 7,7$	$165,8 \pm 6,5$	$66,1 \pm 18,8$	$23,9 \pm 4,5$

Table 4: Underweight, overweight and obesity in both groups of female students (in %)

	SGSP	UWMSC	PSWBP
Underweight BMI $\leq 18,5$ kg/m ²	-	6,9	-
Normal body mass $18,5 \leq \text{BMI} \leq 24,9$ kg/m ²	100	67,8	62,5
Overweight $25,0 \geq \text{BMI} \leq 29,9$ kg/m ²	-	14,9	29,5
Obesity BMI $\geq 30,0$ kg/m ²	-	10,4	8,0

Discussion

For many years in our country the study of nutritional status of students has been conducted, because contemporary population leads specific lifestyle in which diet is usually irregular, and often appeared dietary mistakes may result in underweight, overweight, and obesity (Table 5).

Table 5: Underweight, overweight and obesity among students of different higher education institutes in the country (in %)

Location and year of study	Num- ber of studied people	Under- weight	Normal	Over- weight	Obesity
Poznań 2001 [5]	62	9	63	28	
Gdańsk 2001/2002 [10]	272		83,4	12,8	3,8
Olsztyn 2001[4]	1406	29,3	59,2	10,0	1,5
Białystok 2002/2003 [3]	310	30,2	56,1	10,2	3,5
Łódź 2010/2011 [11]	350	11	78	10	1,0

The results of the study concerning nutritional status of students of different higher education institutions in the country show that the problem of overweight and obesity in this group of patients has been observed for years. While overweight is usually a muscle type, and does not cause health problems, obesity in young people is a serious problem from the stand-

point of public health, demanding appropriate preventive measures.

Both in Poland and other countries the issue of obesity among students is of interest of scientists, doctors and nutritionists. Study conducted among 701 university students in Saudi Arabia showed that among students at the age of 21.7 years only 45.7% showed normal BMI, overweight was found in 31% of respondents, while 23.3% were obese [12]. The results of other studies conducted in India showed that among 192 first-year students at the University of Karachi 22.1% of men and 27.1% of women showed overweight or obese [13].

References:

- Jarosz M, Rychlik E: The obesity epidemic - what future awaits us. *Gastroenterol. Pol.* 2010;17: 47-52; Fact sheet N°311, WHO May 2012
- www.who.int/mediacentre/factsheets/fs311/en/index.html
- Zuzda J, Latosiewicz R, Półjanowicz W: Studies in obesity among male and female students of Białystok Technical University and the University of Economics in Białystok. *Economy and Management*, 2010;1:74-80
- Przybyłowicz K, Cichoń R: Estimation of obesity among female students by BMI classification and measurement of the width of the base of the wrist. *Medical News*, 2002; 71: 1, 40-3
- Bajerska-Jarzębowska J, Jeszka J, Człapka-Matyasik M et al: Diet, anthropometric parameters of nutritional status and physical capacity of the selected group of students. *Food, Science, Technology, Quality* 2004; 3: 9-17
- Tatoń J, Czech A, Bernas M: Obesity, metabolic syndrome. *Medical Publisher PZWL, Warszawa* 2007
- Jarosz M, Respondek W: Obesity - causes and consequences *Fam Med. Prim Care Rev* 2008; 10: 879-86
- Drygas W: Obesity. Environmental and socio-economic conditions. *Med. Metab.* 2003; 7: 47-51
- Ferro-Luzzi A, Sette S, Franklin S et al.: A simplified approach of assessing adult chronic energy deficiency. *Eur. J. Clin. Nutr.* 1992; 46: 173-86
- Wojtowicz E: Body mass density, active and fatty tissue vs. BMI of first year full-time courses male students of the Jędrzej Śniadecki Academy of Physical Education and Sport in Gdańsk in the academic year 2000/2002. *Ann. UMCS*, 2005; 60: 325-9
- Kardjalik K, Bryła M, Maniecka-Bryła I: Health behaviors related to nutrition and overweight and obesity among students. *Probl. Hig. Epidemiol.* 2012; 93:71-9
- Turki A: Overweight and obesity among university students, Riyadh, Saudi Arabia. *Middle East J. of Family Medicine*, 2007;5: 2-8
- Hingorjo MR, Syed S, Qureshi MA: Overweight and obesity in students of a dental college of Karachi: lifestyle influence and measurement by an appropriate anthropometric index. *J. Pak. Med. Assoc.* 2009; 59: 528-32

Conclusions

- 1) Among the students and the regular soldiers to 30 years of age underweight was not registered. However, underweight was found among 6.9% of female students of Maria Skłodowska - Curie University of Warsaw.
- 2) Overweight among students and soldiers is a muscle type, as proven by the low rate of obesity.
- 3) Obesity and underweight among the studied population indicates unbalanced nutrition in terms of energy, which in the long run may result in the formation and development of specific diet-related diseases.