

FATS AND THEIR IMPACT ON PHYSICAL CONDITION AND PERFORMANCE OF CADETS AT THE ARMED FORCES ACADEMY IN LIPTOVSKÝ MIKULÁŠ

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Abstract

This paper is concerned with physical development and performance of students who are trained and educated to become professional soldiers. The author aims to point to the students' performance in the following tested disciplines: the men were tested in the 12-minute endurance run with the average result of 2,793.0 m and navigation of the obstacle course according to the Tel-1-1 regulation with the average result of 1:31.7 minute. The women were tested in the standing long jump with the average length of 183.9 cm and the 1000-metre run, where they reached the average time of 4:08.2 minutes, or the 12-minute run, where the average distance was 2,412.0 m, depending on fat gain. Excess body fat levels, which have a negative influence on performance, were as follows: the subcutaneous fat values were 29.7% in the women and 18.2% among the men and the visceral fat values were 6.5 in the men and 3.5 among the women. The BMI in the men was 25.1 and in the women 22.1.

Keywords

Fats – subcutaneous fat, visceral fat, body weight, BMI, performance

INTRODUCTION

Good physical condition and functional capacity of the cadets, who are aged between 19 and 23 years and who study different fields at the Armed Forces Academy in Liptovský Mikuláš to become professional soldiers, play an important role in their education and training. One of the factors that have a negative impact on functional and physical capacity is the decreased physical fitness and performance caused by overweight. Even though the cadets can do various physical activities within their regular and fitness programme, the results are not satisfactory.

In our paper, we search for evincible diagnostic procedures through which we can obtain information that points out the current state of physical development, fitness and performance, including potential negative prospects for the cadets and their assignments in the Armed Forces of the Slovak Republic.

METHODOLOGY

Body weight, strength and aerobic skills of the cadets studying at the Armed Forces Academy were measured and assessed in order to gain information on their physical performance. Evaluation of

physical development was focused on anthropometric measurements of body weight and height, which were used to calculate the BMI. The amount of subcutaneous and visceral fat was measured by the standard Tanita BC-545N digital scales. Functional development of the men was assessed by a 12-minute endurance run and navigation through an obstacle course according to the standard (8). The women's functional development was evaluated by the standing long jump, a 1000-metre run and a 12-minute run.

The ideal body weight was calculated according to the following formula (7): men – body height x 0.71 – 58; women – body height x 0.62 - 49. The data that we obtained were processed by means of basic statistical characteristics: \bar{x} , s^2 , modus, median, r . Our study group comprised 42 men and 15 women, who study technical and management fields. Their numbers depend on the requirements imposed by the Ministry of Defence of the Slovak Republic that are related to postings needed in individual stages of the armed forces development.

RESULTS

Table 1 shows the statistical characteristics of physical development in the men: age 21.6 years; body height (cm) 180.6; body weight (kg) 81.1. Table 3 presents the statistical characteristics of physical development in the women: age 20.7 years; body height (cm) 165.7; body weight (kg) 61.8. Ideal body weight for men is 70.22 kg and for women 53.7 kg.

The men's BMI equalled to 25.1 and the women's BMI was 22.1. The men's subcutaneous fat level was 18.2 % and visceral fat level equalled to 6.5. The women's subcutaneous fat level was 29.7 % and the visceral fat level equalled to 3.5. The results of the 12-minute endurance run were as follows: the men were able to run the distance of 2,793.8 m and the women ran the distance of 2,412.0 m. The men were able to navigate the military obstacle course in average time 1:31.7 min. The women's standing long jump result was 183.9 cm. The women were able to run the distance of 1,000m in 4:08.2 min. Table 2 shows the correlation matrix for the men. There was a very strong dependence between the visceral and subcutaneous fat levels (0.776). There was also a strong dependence between the visceral fat levels and the body weight (0.556). The study did not prove a significant dependence between the fat levels and endurance activities (12-minute run and the obstacle course) among the men. As far as the women are concerned, there were bigger differences between the fat levels and physical activities. Table 4 shows a very strong dependence between the 12-minute run and the standing long jump (0.703) and the 12-minute run and the 1,000-metre run (0.783). Furthermore, there was a strong dependence between the 1,000-metre run and the subcutaneous fat levels (0.526) and a significant dependence between the subcutaneous fat levels and visceral fat levels (0.402). There was also a significant dependence between the 12-minute run and the subcutaneous fat levels (0.472).

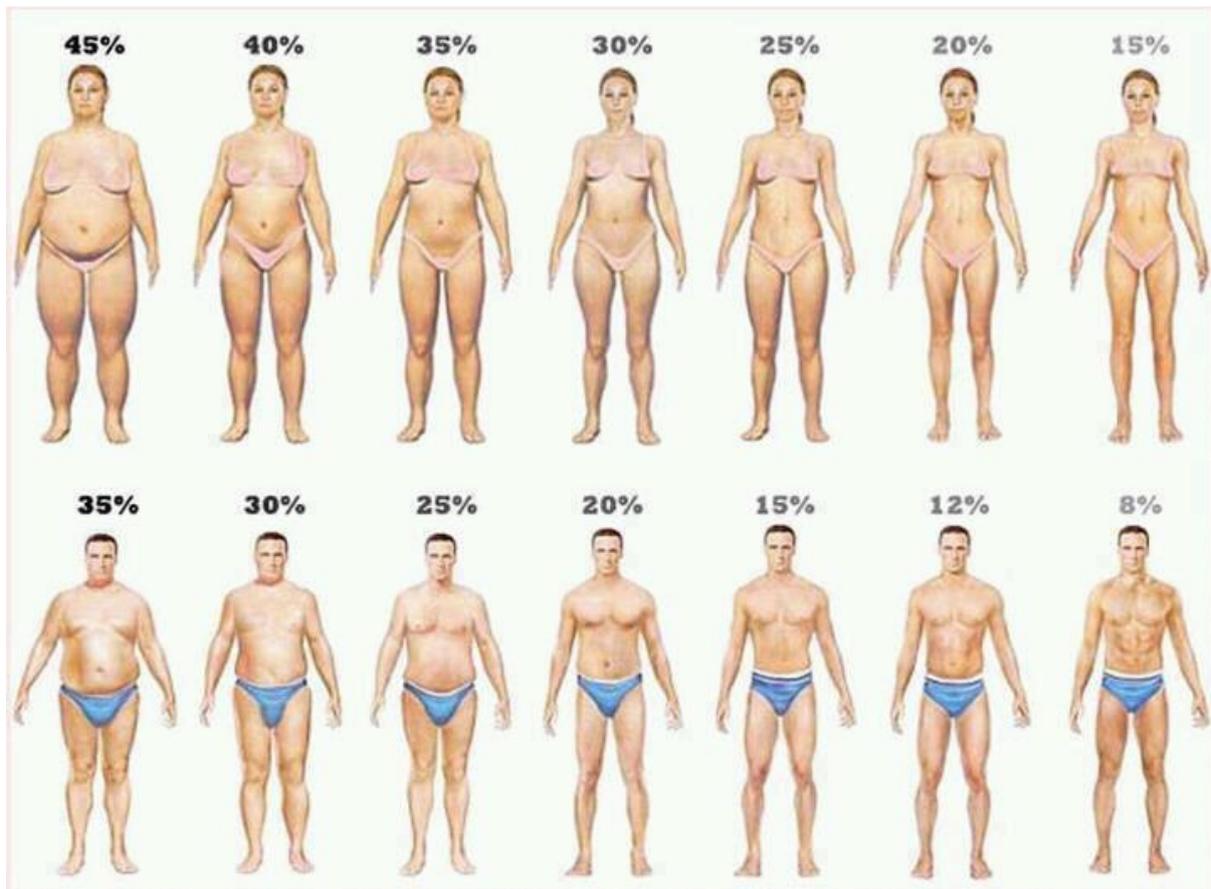


Figure 1 Visual demonstration of the human body with different fat levels

DISCUSSION

We found a statistically significant difference (10.9 kg) between the men's real weight and the ideal weight. It means that the young men have a tendency toward obesity, which can be proved also by their BMI equal to 25.1, in contrast to the women, whose BMI equals to 22.1. While the women's level of visceral fat is low (3.5), their subcutaneous fat level is rather high (29.7%), considering the fact that their average age is only 20.7 years. Figure 1 shows the human body with different fat levels. The men's and women's performance in aerobic tests was satisfactory, taking their fat levels into

consideration. We can assume that the cadets are strongly motivated as they need to fall within certain limits in order to pass a semester. And they manage to do so due to their strong wills.

CONCLUSION

Following the results of testing, we can say that the cadets have different individual levels of physical fitness, condition and performance depending on their body weight.

The data we acquired show that the cadets, who will become professional soldiers, should have completely different

results of their functional development assessment in comparison to ordinary people. These results should help them perform demanding jobs relating to their military specialisations. Furthermore, it is necessary to develop more effective fitness

programmes focused on development of physical condition so as to avoid undesirable weight gain. Another thing that could help reduce the cadets' weight is lifestyle education focused on monitoring and alteration of eating habits.

Table 1 Men - characteristics of physical development and performance

	age	height	weight	BMI	%fat	Visc.fat	12min	obstacle course
n	42	42	42	42	42	42	42	42
\bar{x}	21.6	180.6	81.1	25.1	18.2	6.5	2793.0	01:31,7
s^2	21.14	6.949	9.03	2.15	4.68	1.88	166.51	00:10.1
modus	21	186	92.90	24.80	24.0	7.0	2650.0	01:17.0
median	21	180.5	80.9	25.1	19.7	7.0	2770.0	01:32.0

Table 2 Men - correlation matrix of dependence between fat levels and physical activity

	BW	% fat	Visc. fat	12min	OC
BW	1				
% fat	0,36811	1			
Visc.fat	0.556+	0.779*	1		
12min	0.137217	-0.1105	-0.16697	1	
OC	0.074784	0.151937	0.018581	-0.1286	1

* very strong dependence
 + strong dependence
 □ significant dependence

Table 3 Women – characteristics of physical development and performance

	age	BH	BW	BMI	% fat	Visc.fat	jump	1,000m	12min
n	15	15	15	15	15	15	15	15	15
\bar{x}	20.7	165.7	60,8	22.1	29.7	3.5	183,9	04:08.2	2412.0
s^2	1.447	6.681	6.14	1.83	6.73	1.46	14,80	00:20.2	178,6
modus	20	162	65.3	22.4	0	3	195	04:37.0	2610
median	20	163.5	61.8	22.4	31.7	3	190	04:04.0	2400

Table 4 Women – correlation matrix of dependence between fat levels and physical activity

	weight	% fat	Visc. fat	jump	1,000m	12min
weight	1					
% fat	0.298	1				
Visc. fat	0.664 +	0.402 □	1			
jump	0,155	-0,164	0.283	1		
1,000m	-0,005	0,526 +	0.086	-0.380	1	
12min	-0,145	-0,472	-0.180	0,703 *	-0.783	1
*	very strong dependence					
+	strong dependence					
□	significant dependence					

Legend: BH – body height, BW – body weight, BMI – body mass index, % fat – subcutaneous fat, Visc. fat – visceral fat – fat that is stored within the abdominal cavity, 12 min – the Cooper 12-minute run, OC – obstacle course according to the TEL- 1- 1 military regulation.

REFERENCES

Čelikovský, S. et al. (1979). *Antropomotorika* Praha: SPN.

Carter, J. E. L. (1975). *The Heath –Carter Somatotype Metho.* California: San Diego, State University.

Kasa, J. (1999), (2000). *Antropomotorika (lecture notes)*. Bratislava: Comenius University.

Litva, D. (2008). Intenzita zaťaženia v hodinách kondičnej a vojensko – praktickej telesnej prípravy študentov Akadémie ozbrojených síl Liptovský Mikuláš. Medzinárodná vedecká konferencia. In. *Sborník abstrakt mezinárodní konference „Sport a kvalita života 2008“* Brno: Tiskcentrum s.r.o.

Moravec, R. – Kampmiller, T. – Sedláček. Et al. (1996). *EUROFIT – Telesný vývoj a pohybová výkonnosť školskej populácie na Slovensku*. Bratislava: The Slovak Scientific Society for Physical Education and Sport.

Pavek, F. (1977). *Telesná výkonnosť 7 - 19 lete mládeže ČSSR*. Praha: Olympia.

Ramacsay, L. et al. (2001). *Funkčne morfológické a motorické aspekty laterity mladých športovcov, ich aktualizácia a možnosť ovplyvňovania v športovej príprave*. Bratislava: Faculty of Physical Education and Sport, Comenius University.

Tel-1-1, Military Regulation on Physical Training in the Armed Forces of the Slovak Republic, (2001) Bratislava: MoD.

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