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COMPOSITION OF BODY MASS INDEX FOR YOUNG WOMEN WEIGHTLIFTERS

(Preliminary communication)

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Abstract

The composition of body mass is important in sport. Different development and proportions of the human body can potentiate or complicate the sports achievements. The report analyzes the dynamics of the body mass index composition for women weightlifters cadets. The aim of this paper is to determine and compare the dynamics of the composition of body mass index of young women weightlifters. The research was realized on a sample of 10 young women weightlifters on average aged 17.5 years old and of four years sports experience. The body composition was determined using the following variables: body fat percentage (% FT), absolute amount of body fat (AQFT), active body mass (ABM), absolute amount of muscle (AQMM) arm muscle circumference (MCA), muscular thigh circumference (MCT) and body mass index (BMI), indicating the minimal dynamics about the established values, which is due to a different periods of training. The somatotipical caracteristics indicate some endo-mesomorphosis during these three studies.

Keywords*: body mass index, somatotype, youth women weightlifters,Mean*

INTRODUCTION

According to WHO there is a big increase in the obesity rates among young people worldwide. Body composition is one of the most important athlete's characteristics in many sports. Differences in body composition and proportions explain much of the differences in performance in many sports. Present study is based on anthropometric measurements aimed to determine and compare the dynamics of the composition of body mass index of youth women weightlifters, which will contribute to comprehensive assessment of their anthropometric profile.

METHODS

The contingent of the study are 10 youth women weightlifters aged on average 17.5, and sports experience of 4.0 years on average. Three anthropometric measurements were held during centralized training of the national team with the study contingent. Measurements were realized by standard and validated methods with suitable tools (Slancev (Слънчев), 1998.).

Measured anthropometric parameters were calculated by parameters characterizing the composition of the body mass index: body fat percentage (% FT), absolute amount of body fat (AQFT), active body mass (ABM), absolute amount of muscle (AQMM) arm muscle circumference (MCA), muscular thigh circumference (MCT) and body mass index (BMI). The somatotype of competitors was determined by the Hesth-Carter method (1992.).

The results were processed with SPSS-19 and Excel.

RESULTS AND DISCUSSION

Results on the parameters of the composition of body mass index of the young women weightlifters showing the progress in different studies were analyzed in Table 1.

We found out minor differences showed in Table 1. for the examined parameters for this period. Analysis of the composition of body mass index shows a high percentage of body fat - more than 24%, and the same in the absolute quantity of body fat over 19 kg. Between the first and second study (Figure 1.) a significant reduction of parameters values - percentage body fat (% FT) to -1.07% (-4.31%) as well as in the absolute quantity of body fat (AQFT) respectively - 0.62 kg. (-3.12%), and between the first and third study observed approximately the baseline with minimal increase in FT% with 0.47% (1.89%) and AQFT 0.38 kg. (1.91%).

Active body mass of the surveyed competitors has a high level - on average over 59 kg. The absolute quantity of muscle mass also has high values - over 46 kg., which shows the well-developed musculature. Some positive changes were found between the first and second study in both the active body mass (ABM) with 1.62 kg. (2.69%) and the absolute quantity of muscle mass (AQMM) with 4.99 kg. (10.63%). Minor changes were observed both in ABM with -0.38 kg (-0.63%) and in AQMM with -0.77 kg. (-1.64%) between the first and third study.

Positive growth of 1.68 cm (7.02%) is showed for the upper arm muscle circumference (IOM) between the first and second study, and minor negative changes of -0.39 cm (-1.63%) are found between the first and

Table 1. Average data and differences in absolute and relative performance levels for the composition of body mass index of the young women weightlifters

Parameters	Studies									Differences			
	I			II			III			I – II		I – III	
	X	V%	S²	X	V%	S²	$\bar{\bar{X}}$	V%	S²	абсол.	относ.%	абсол.	относ.%
%FM	24,84	8,94	2,22	23,77	8,33	1,98	25,31	22,35	5,66	1,07	4,31	-0,47	-1,89
AQFT	19,87	30,46	6,05	19,25	29,68	5,71	20,25	43,23	8,75	0,62	3,12	-0,38	-1,91
ABM	60,13	20,51	12,33	61,75	20,52	12,67	59,75	18,49	11,05	-1,62	-2,69	0,38	0,63
AQMM	46,96	18,28	8,58	51,95	30,19	15,68	46,19	17,12	7,91	-4,99	-10,63	0,77	1,64
MCA	23,94	14,83	3,55	25,62	13,97	3,58	23,55	8,77	2,06	-1,68	-7,02	0,39	1,63
MCT	59,4	8,45	5,02	62,95	15,52	9,72	58,58	8,69	5,09	-3,19	-5,37	0,82	1,38
BMI	29,56	22,25	6,58	29,93	21,97	6,58	29,56	24,02	7,10	-0,37	-1,25	0,00	0,00

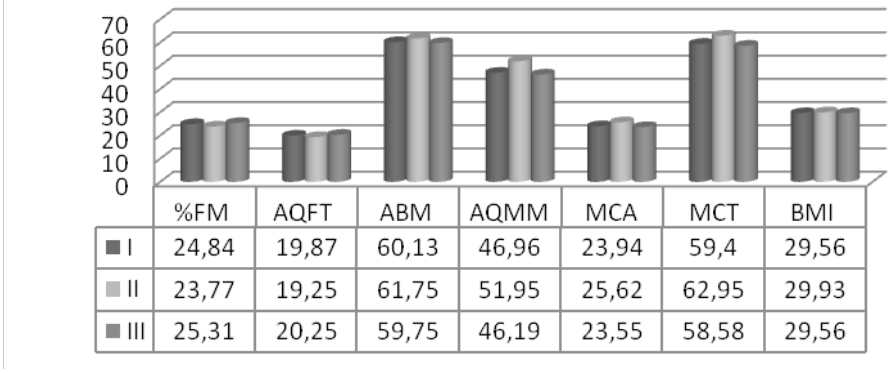

Figure 1. Dynamics of average data about three studies on the composition of body mass index for young women weightlifters

Table 2. Means and variability of the parameters for the somatotypes and differences in absolute and relative values of the young women weightlifters

Parameters	Studies									Differences			
	I			II			III			I – II		I – III	
	$\bar{X}$	V%	S²	$\bar{X}$	V%	S²	$\bar{X}$	V%	S²	absolute	relative %	absolute	relative%
ENDO	5,73	11,6	0,66	5,21	19,27	1,00	5,65	22,28	1,26	0,52	9,08	0,08	1,4
MESO	7,17	48,92	3,51	7,44	47,52	3,54	7,79	42,84	3,34	-0,27	-3,77	-0,62	-8,65
ECTO	0,10	0,00	0,00	0,10	0,00	0,00	0,1	0,00	0,00	0,00	0,00	0,00	0,00

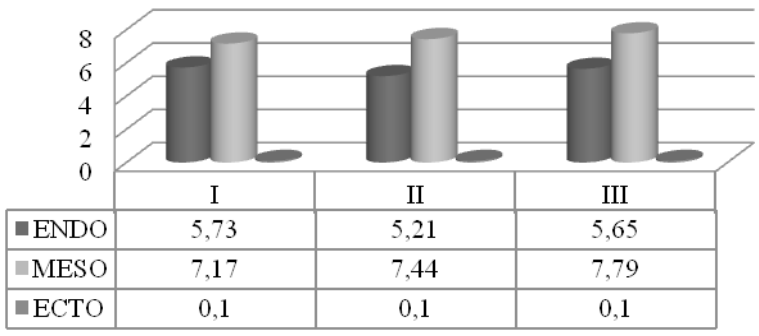

Figure 2. Comparison of somatotypes of the contingent (researched period)

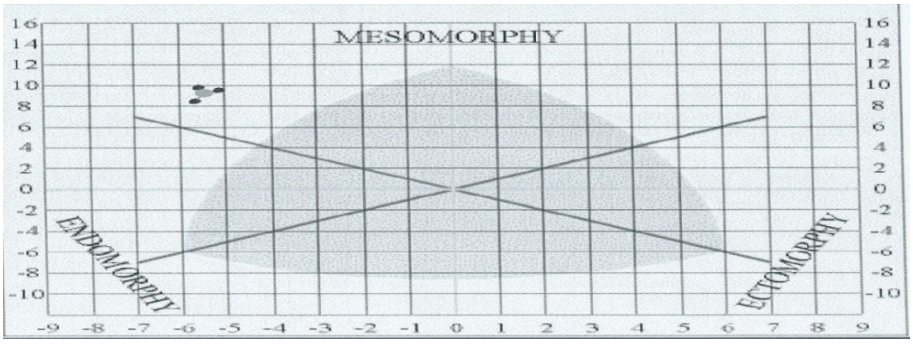

Figure 3: Somatograme – young women weightlifters (from three studies)

third study. At the same time the parameter muscle thigh circumference (MCT) has significant changes between the first and second survey, respectively with 3.19 cm (5.37%), and between the first and third - slight positive changes to -0.82 cm (-1.38%).

Minor differences were observed for the parameter BMI during the research period (Panayotov, 2014.). The absolute quantity of fat appears significantly larger than the data given in the literature for the mmajority of sportswomen and is near to those who do not practice any sport but are in the same age group.

One of the characteristics of women weightlifters is the greater weight but the same height in comparison to those who do not practice or who practice some other sports. The reason is the large muscle mass developed with a moderate quantity of fat (Durnin, & Womersley, 1974; Carter & Heat, 1992.). The obtained results showed in progress of somatotype of the youth women weightlifters are illustrated in Table 2.

The numeric expression of the average summative somatotype that is found in different studies of our contingent during the research period, is the following:

- In the first study, from 5.73 to 7.17 - 0,10;
- In the second study, from 5.21 to 7.44 - 0,10;
- In the third study: 5.65 to 7.79 - 0,10.

The comparison shows that the mesomorphosis is particularly marked for women weightlifters who have a very good musculo-skeletal attitude (Figure 2.).

For the endomorphic component we observed a slight decrease between the first and second test of CE 0.52 (9.08%) and output CE 0.08 (1.40%). Mesomorphic component has a slight increase between the first, second test of CE 0.27 (3.77%) and the output data as well as for the third study CE 0.62 (8.65%). For the ectomorphic component we observed no change. All somatotypes' parameters are relatively stable and with definite mesomorphosis.

The study of somatotypes for young women weightlifters shows that the researched contingent has endo-mesomorphic body attitude, due to the greater body mass and a greater quantity of subcutaneous body fat, but respectively a larger quantity of muscle mass. Obtained data as a result of the training effect shows a clear tendency to reduce the variability of the studied parameters, which indicates the relevance and the feasibility of the training process. These statements are also proved by the analysis of positively increasing mesomorhpic component. All dependencies are graphically expressed in the somatograme (Figure 3.) including the three studies. These values show the most accentuated mezomorfosis followed by endomorphic and the least ectomorphic development.

Compared means for the research period show that the summative components are characterized by the same development of the three components as the mesomorphic-endomorphic one, due to the higher level of body mass index and the large quantity of subcutaneous fat, but also the greater quantity of muscle mass.

CONCLUSION

The obtained results of parameters providing information on the composition of the body mass index indicate minimal dynamics about the established values, which is due to the different periods of training. The somatotipical characteristics indicate some endo-mesomorphosis during these three studies. The comparative analysis of the results showed that all 3 components of the somatotype had similar values for all the subjects – meso-endomorphic type of body composition. Athletes with this kind of body composition have higher than average percentages of both muscle and adipose tissues.

The method of Heath-Carter used to determine the somatotype can be applied for a complex assessment of physical development and can serve in selection and to control at all levels of sports training. We consider it very useful in the process of specialisation in sport, especially in sports with competitive categories.

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