MORPHOLOGICAL MODEL RELATIVE INDICATORS OF STUDENTS – BASKETBALL PLAYERS IN PRE-CONTEST PERIOD

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Summary. *Training management of basketball players represents an actual and insufficiently developed problem in basketball, which is based on the creation of model characteristics of athletes for each preparation stage. This article explores the model indicators, which typical for the pre-contest period, the elucidation of which allows us to replenish the database about morphological capabilities and reserves of basketball players. The novelty of the research is that the scientific problem of the work was focused on the substantiation of the sports training content of basketball players, the choice of effective means and methods of training, in particular, taking into account the morphological models and their connection with physical preparation of basketball players. The development of model levels of morphological characteristics in the pre-contest period preparation allows us to optimize the training work and search for capable talented athletes who could show the high results. The article describes the application technology of fat and lean body mass evaluation, tests, intended for used to evaluate the effectiveness of basketball techniques and the development of motor education of female students. Absolute and relative components of the body weight of basketball players are established, which have high rate and can be a reliable criterion or determining the morphofunctional status of athletes. The features of constitutional models of female athletes for the pre-contest period are revealed, the knowledge of which helps the trainer to individualize the training process by reference to specific features of constitution.*

Keywords: national team of KazAST, testing, relevant indicators, moving abilities, pre-contest period.

Introduction. The study of the influence of training loads on the growth of sports results, and also, on physical development degree of athletes are caused by the vital requirements of the current level of sporting achievements, in as much as the sports indicator is the eventual result of the manifestation of the motor apparatus function. Numerous scientific data show that in the body of training athletes there are positive morphological changes in response to the impact of physical activity, herewith these changes are specific in nature depending on the type of sport activity.

The question of the influence of intense sports loads on morphofunctional parameters of the basketball body requires the future research for creating a bank of model data for different preparation stages. The study of literary sources showed that the work on the study of morphofunctional structure features of student basketball players of different sports qualifications is not enough, which is an actual problem, restraining the management process

of the basketball players training. The solution of this problem served as the basis for carrying out the present study.

The purpose of the scientific work was aimed to create a database of morphological indicators based on the study of model levels in female basketball students. To solve this purpose, an object of our study this year, was to examine the body weight of students-basketball players of various game role.

Methods and organization of research.

In accordance with the task, research methods were used: biopedagogical (somatometric – anthropometry); pedagogical (observation, response measurement, analytic – quantitative and qualitative analysis, interpretation of findings, drawing conclusions and recommended practices) and statistical.

Anthropometric method determined somatometric signs – the parameters of body measurements of female students engaged in basketball, members

of the national team KazAST by R. Martin classical method 2014.

Body composition calculation of female students was carried out according to

Y. Matejka method 2009.

In assessing the human physical development, great importance is attached to the body quantity of a surface. It is considered, the more this indicator, the better the physical development of the test person. The body surface was determined by the calculation method in terms of total dimensions (length and weight). The body weight was determined at the maximum exposure of a person on a medical balance within the accuracy of 50g in 2–3 hours after a meal.

Total body area was determined from the formula of Izakson:

$$S = 1 + \frac{P + (Z)}{100}, (1)$$

where: S – total body area (V); P – body weight, kg; Z – standing height, cm; Z – (160 + Z) the difference in body height of the test person from 160 cm with a plus or minus sign.

Body composition. As a method of assessing the physical development of basketball players and controlling the training regime in sports morphology, the body composition was determined, which allowed to differentiate the body weight into its separate components: fatty, muscular, bone.

To determine the absolute count of fat component (D), we used the formula of Y. Matejko:

$$D = d * S * k, (2)$$

where: D – absolute body fat mass (kg); S – total body area; k is a constant equal to 1.3, available from experiments; d – mean corpuscular average thickness of subcutis along with the skin, equal to half the sum of seven (in women) or eight (in men) skin fat roll.

To determine the absolute amount of the muscular component of the body weight using the formula:

$$M = L * r^2 * k, (3)$$

where: M – the absolute count of muscular tissue (kg); L is the length of the body (cm); r – the mean value of the radii of the shoulder, forearm, hip, and shin in the places of the greatest amount of musculature, minus the skin-fat layer (cm); k is a constant equal to 6.5.

The absolute amount of bone component in body weight was calculated by the formula:

$$O = L * O^2 * k (4)$$

where: O – absolute mass of bone tissue (kg); L is the length of the body (cm); O² is the mean square diameter of the distal parts of the shoulder, forearm, hip, and lower leg (cm); k is a constant equal to 1,2.

Research results. The researches were conducted on 10 basketball players of the KazAST national team, whose age averaged 21.5 years. Researches were conducted during the preparation for the competition.

Regular physical exercises and sports affect on absolute weight of the body, which can undergo significant changes in the direction of increase or decrease. At the same time, it is of definite scientific interest to know at the expense of which tissue, mainly muscle or fat, the body weight is maintained. In our study, the body weight of female basketball players was studied by Y. Matejka method.

Table 1 presents the absolute and relative parameters of bone, fat and muscle components of body weight in the tested basketball players. These data indicate of stable rate of absolute and relative bone component on average equal to 10.88 and 14.8 percent. The absolute and relative values of the muscular component that have reached a high level of development in athletes have the most pronounced positive changes.

Table 1 – Components indicators of the body weight of female students – the KazAST team basketball players

№	Name	Age, years	Height, cm	Weight, kg	Body surface		Bone component		M u s c l e component		Fat component	
					A. m2	R,%	A kg	R %	A kg	R %	A kg	R %
		1	2	3	4	5	6	7	8	9	10	11
1	B-na S.	22	177	71,5	1,89	0,026	10,4	14,5	39,37	55,06	5,72	13,0
2	T-ya T.	22	192	81,5	2,14	0,026	11,69	14,34	41,84	51,34	11,26	13,8
3	K-va T.	21	189	69,3	1,98	0,028	11,92	19,13	37,56	54,19	6,72	6,5
4	M-va N.	22	175	67,2	1,82	0,027	10,65	15,84	36,69	54,59	10,5	6,1
5	B-va G.	21	187	87,5	2,14	0,024	12,20	13,94	37,57	42,93	14,62	8,0
6	G-va L.	21	186	84,5	2,10	0,024	10,62	12,56	43,88	51,93	17,59	20,8
7	S h - k o O.	23	177	75,0	1,92	0,025	10,40	13,86	41,97	55,96	11,92	7,4
8	B-va V.	23	185	70,4	1,95	0,027	10,49	14,90	37,63	53,45	6,75	9,6
9	M-ar A.	19	182	73,0	1,95	0,026	10,70	14,65	38,83	53,20	10,14	13,8
10	I-va M.	21	178	65,0	1,83	0,028	9,73	14,97	36,41	56,01	5,54	8,2
$\bar{O}$		21,5	182,8	74,79	1,972	0,026	10,88	14,87	39,18	52,87	10,08	10,74
% of body weight								19,8		70,7		14,3
r			-0,2	0,6	0,9	-0,2	0,7	0,1	0,3	-0,5	0,3	0,3
r					0,9	-0,9	0,6	-0,6	0,6	-0,8	0,8	0,5

The conducted studies allowed to establish the average values of the absolute level of the muscular component, which amounted to 39.18 kg, and the relative – 52.87%, which averages over half of their body weight 74.49 cm to their body weight. These data indicate a high level of their muscle mass by 13.9%, which is the result from the workout session and reflects a good level of model, providing a basis for physical preparation.

In relation to the two previous components (bone and muscle), the fat component has the greatest lability, as it is the measure of energy resources of the female athlete's body. The fat component in our studies on absolute average data was at the level of 10.08 kg, and in percentage terms was 10.74%, which is below standard for individual fluctuations from 6.5 to 20.8%.

These levels of anthropometric research can serve as a model, for the pre-contest period for coaches of basketball-educated gigantoid physique (asthenic).

Selection of athletes on the components of their physique formed by the training process allows us to specify the tasks and methods of training, to determine the tests for monitoring its results for basketball players of different soma types, and to individualize the training process.

Calculation of the coefficient of correlation between the body mass index and morphofunctional components of the basketball players' body in the pre-contest period of preparation is shown in Picture 1.

The analysis showed that a high positive dependence is characteristic for body weight index and surface parameters with absolute value, and high negative with relative level of the body surface, muscle and fat component. The average positive dependence was found with the relative size of the body surface, bone and fat components.

Growth rates are highly dependent on body weight, body surface component, average negative values are marked with a muscle component.

Note: 1- growth, 2 weight; 3- body surface absolute value, m2; 4- body surface relative value, M2; 5 - bone component, absolute value kg; 6 - bone component, relative value kg; 7 muscle component, absolute value kg; 8 - muscle component, relative value, kg; 9-fat component, absolute value%, kg; 10 - fatty component, relative value, %;

Figure 1- Indicators of the correlation coefficient between body mass index and morphofunctional components of basketball players' body in the pre-contest period of preparation. In scientific literature it is determined that the basketball players of the Olympic tournament participants in 2000 in Sydney had a relatively large body length, low weight values and a longer length of individual segments compared to age norms, which influenced the high performance of the competition activity. The average growth of basketball players was within 179.0–184.6 cm [9]. In our studies, they approximated by average data to 182.8 cm with fluctuations of 177–192 cm. The constitutional structure features of the body of young basketball players in our studies can be considered optimal.

Conclusions:

Absolute and relative components of the body weight of KazAST team basketball players have high model indicators for the pre-contest period and can be a reliable measure for their use in the selection of athletes in team.

Models knowledge of athletes' constitutional features will help to individualize the training process, taking into account the constitution.

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