THE SIGNIFICANCE OF MORPHO-FUNCTIONAL INDICATORS IN ASSESSING THE PROSPECTS OF ATHLETES SPECIALIZING IN NATIONAL TYPES OF WRESTLING

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ABSTRACT

The paper evaluates the morpho-functional indicators of 31 wrestlers specializing in the national Turonian form, taking into account their weight categories. The functional state of the Turonists is assessed positively in terms of physical performance and maximum oxygen consumption (MOC) and MOC - minute volume of blood circulation. A promising group of adolescent wrestlers was identified, the functional state of which is characterized by high values of PWC-170 and indicators of BMD, IOC.. To study differences in physique, the total and partial sizes of wrestlers of various weight categories were assessed. In order to compose a general morphological picture of a wrestler - by the type of Turonian, as integrative anthropometric features, one can distinguish the length and weight of the body, the circumference of the chest, the length and girth of the lower leg and forearm, the length of the body, which are leading depending on the weight category of the wrestlers.

Keywords: kurashists, indicators of physical performance, maximum oxygen consumption, anthropometry, total and partial sizes, physique features, weight category.

RELEVANCE

In combat sports, the problem of optimizing the training of athletes - combatants, which is based on the analysis of a complex of objective data on the state of the most important morpho-functional systems of the body, is urgent (Boyko V.F., G.V. Danko, 2002, Nerobeev N.Yu., 2013 , A.N. Razumov, Kolomiets O.I., 2011, Tsipin L.L., Barnikova I.E., 2016). The reasoned search for effective means of achieving high sports results with harmonious development and health preservation on the basis of objective and reliable indicators of the morpho-functional systems of the body of athletes is a priority problem of modern sports science.The innovation of the planned research is due to an integrated approach to the analysis of pedagogical, morphological, physiological markers of general and special performance of athletes specializing in the type of Turon wrestling.For the first time in the work, the analysis of the specifics of Turon wrestling and its significance among national and international types of wrestling, performed on a contingent of qualified athletes at the stage of sports improvement, is carried out.This approach implies solving the important problem of ensuring the optimal ratio of national and international in the development of world physical culture, bearing in mind an attentive

attitude to cultural and national traditions in combination with progressive tendencies of the best international varieties of sports activity (Dakhnovsky V.S., Lishchenko, 1998, pp. Dashinorboev V.D. 2000, Daupaev M.O., 2000, Oorzhak S.Y., 2009, Denisenko, 2018).According to Denisenko A.N., 2018 the irrationality of the choice of means in this ratio and the primitive system of their formation when building training programs leads either to the loss of the originality and color of national sports, or to their complete oblivion under the influence of modern trends in sports activity.

The Degree of Study of the Problem: Currently, the most studied specializations in combat sports are such disciplines as Greco-Roman wrestling, sambo, judo, freestyle wrestling (Karelin, 2005, Yu.M. Kim, L.P. Yugai, 2005, Choi Sung Mo , 2009, Uruimagov V.B., 2009, Kolomiets O.I., 2011, Pokhachevsky A.A., 2011, Taymazov A.B., 2017, etc.)In Uzbekistan, work has been done on national types of wrestling, in particular, on belbogli kurash, Fergana, Bukhara, dedicated to improving the technical and tactical training of young kurash fighters, the works of Kerimov F.A., 2002, Mirzakulov Sh. A., 2014, Boimuradova I.Kh, Karimova B, 2009, Mirzanova Sh.S., Ishmukhamedova T.R., 2014).In this regard, the least studied of the kurash species is the Turonian struggle, where a number of issues remain unclear. The analysis of scientific literature shows that most of the works on the types of wrestling are devoted to the methodological aspects of sports training management, which includes physical training, as well as its sections of technical tactical and psychological training.However, to date, there are no studies in which the assessment and analysis of morphological, physiological indicators in conjunction with the criteria of special and general preparedness were carried out. This approach will make it possible to control the training process, since the assessment of the dynamics of changes in technical parameters connecting the magnitude and direction of the impact of physical loads will also reflect the adaptive capabilities of the body of athletes.

Organization of the Experiment and Research Methods: To solve the set tasks and check the initial assumptions, a complex of pedagogical and biomedical research methods of research will be used. To assess the physical development, morphological methods will be used, in particular, on the basis of anthropometric research methods, a comparative assessment of the physique of wrestlers, taking into account the weight category, has been carried out.The results of the research were processed by the methods of mathematical statistics with the calculation of the degree of reliability, the standard deviation, the use of correlation analysis according to the formulas set forth in the textbook Tolametov A.A., Akbarova B., 2010 is provided.

Purpose of the Research: Assessment of physical development and functional state of 16-19-year-old Turonist wrestlers, taking into account weight categories.
The article provides an assessment of the functional indicators of wrestlers specializing in the Turonian wrestling. Wrestlers aged 16-18 differed in terms of physical working capacity and VO2 max. The results of the medical and biological examinations allow us to consider that in the junior combined team in Turonian, a greater percentage of the examined Turonian athletes are "practically healthy".Of the 23 Turonian wrestlers we examined, 7 athletes demonstrated

the best indicators of the cardiorespiratory system and high physical performance, 2 boys had abnormalities in the ECG, and one athlete had high blood pressure. Blood pressure and heart rate indicators were recorded at rest, during exercise and after 5 minutes - recovery.By their values, one can judge the severity of fatigue or overtraining of an athlete. The economization of the functions of the cardiovascular system in young Turonists is manifested by lower blood pressure at rest. The IOC indicators after the first load of the PWC - 170 test were: 4.0 - 4.9 l / min were found in 10 people, from 5.0 to 5.9 l / min also in 10 people, from 6.0 to 6.9 in 3 athletes.The recovery of the IOC indicators was established at 3 or 4 minutes after two loads and corresponded to the initial value at rest, which indicates good adaptation to loads and a high level of fitness (Table 2). IOC or minute volume of blood circulation is an integral indicator of the pumping function of the heart and largely depends on heart rate - heart rate. In the process of systematic training influences, the IOC increases, while the heart rate decreases.Since the surveyed sample of athletes belongs to the youth age group, it can be predicted that with age and development of the body, the IOC will still increase. Average indicators of physical performance PWC - 170 fluctuate within 1434.97 ± 197.44 kg / m / min or - 237.19 ± 34.72 watts. Among the examined Turonists, the highest indices of physical working capacity according to the PWC-170 test were established for 7 athletes who seem to be the most promising, these are athletes numbered 6, 5, 19, 15, 8, 23, 15 (tab. one.)Their indicators range from 2094.4 to 1606.68 kg / m / min, which is much higher than the average indicators of wrestlers. The average parameters of the VO2 max were 4.26 ± 0.45 l / min, and the relative values were 62.6 ± 7.19 ml / kg / min, which makes it possible to assess positively the aerobic abilities of athletes. The best aerobic capabilities were revealed in the most promising athletes under No. 5, No. 6.

The performed analysis of anthropometric data showed a tendency to an increase in the absolute and relative body sizes of Turonian wrestlers with an increase in the weight category among athletes.Depending on the weight category, the body length also changes in parallel, followed (in order of importance) the length of the leg, arm, trunk, thigh, lower leg, shoulder, and hand length. The analysis of partial body sizes showed that according to the values of the coefficient of variability, all signs can be divided into 3 groups: signs that are most susceptible to variability are indicators of all 4 skin and fat folds taken from the back of the shoulder, under the shoulder blade, on the side and on the abdomen , where the coefficient of variability varies from (υ = 40.2 - 52.9%).The analysis of total traits revealed the variability of the trait in terms of body weight compared with body length. The smallest percentage of variability is set for body length. So, the coefficient of variability for body length is υ = 3.3%, and for body weight υ = 11.7% was for heavyweights (Table 4). It should be noted that, depending on the weight category, insignificant differences were revealed in the indicators of arm and leg length between light and average weights.So for lightweights, the arm length is 77.7 ± 2.5, with υ = 3.2%, the leg length is 93.3 ± 2.9 with υ = 3.1%. For average weights, the arm length is 77.3 ± 3.7 with υ = 4.8, the leg length is 90.9 ± 3.9, with υ = 4.3%. A perceptible difference in arm and leg length, as opposed to light and middleweights, is set for heavyweights. So the arm length was 79.8 ± 2.8, and the leg length was 93.3 ± 5.2, with υ = 5.6%. It should be emphasized that B.A. Nikityuk, 1996, V.P. Sergienko, 2003, Safarova D.D. Tastanov N.A. et al., 2003 showed that the

length of the body is under strict genetic control and is not very susceptible to the influence of environmental factors.In connection with the results obtained, the question arises: "What is the reason for the increase in body length in athletes with different weight categories? We have analyzed the length of the body in the studied groups of Turonists. It turned out that the difference in body length is due not only to the length of the legs, but also due to the length of the body.So in light weights the body length was 89.3 ± 1.5 cm with $\upsilon = 1.7\%$; for average weights - 94.0 ± 6.4, with $\upsilon = 3.6\%$, and for heavyweights - 94.5 ± 4.9 with $\upsilon = 5.2\%$. There is a clear tendency to increase the length of the body. It should be noted that the variability of morphological characteristics is high among wrestlers in heavy weight categories.At the same time, individual dimensional characteristics (shoulder width, pelvic width) among wrestlers also remain variable depending on the weight category of athletes. So for lightweights, the shoulder width is 35.7 ± 14.5 at $\upsilon = 4.5$, the width of the pelvis is 27.8 ± 1.0 at $\upsilon = 3.7$. For average weights, the width of the shoulders is 45 ± 2.9, with $\upsilon = 7.5$, the width of the pelvis is 31.2 ± 2.5, $\upsilon = 2.5$. And finally, for heavyweights, the shoulder width is 46.7 ± 3.5, and the pelvic width is 33.5 ± 2.3, that is, these signs change depending on the weight category.Variability of signs estimated as above average is established for the girth dimensions of the body, in particular, the girth of the shoulder, forearm, thigh, lower leg, in particular, $\upsilon = 18.7\%$ for the shoulder, forearm $\upsilon = 18.6$, thigh girth $\upsilon = -18.6\%$, leg girth $\upsilon = 23.6\%$. The girth dimensions, which determine body weight, react most to the influence of environmental factors. Scientific research and practical experience confirm that under the influence of physical exertion, especially the force direction, individual muscle groups can be increased even by 50% or more percent.In this case, under the influence of physical exertion, not only the quantitative signs of muscle tissue change. It turns out that between physical exertion and an increase in muscle volume, there are mutual adaptations of various body systems to changing functional relationships (BA Nikityuk, 1996, RN Dorokhov 2005). This circumstance must be taken into account for the purposeful management of the training process.A large variability of the feature is established for such a feature as -excursion of the chest $\upsilon = 21.4\%$, which indicates different values of the volume of the chest, that is, this feature is characterized by heterogeneity. Sergienko, 2003, in his study on the hereditary determinism of anthropometric traits, argued that girth traits are hereditary by 60%, and 40% are influenced by the external environment. At the same time, it should be noted that the size of the hand of the "Turonists" changes in different ways. So, in weight from 48 to 55 kg (in light weights it is estimated as short, 56 kg to 75 kg - it is also assessed as short, and with an increase in weight over 76 kg, the length of the hand increases.

vThe study of the peculiarities of selection by morphological characteristics for wrestling Turonian in different weight categories allowed to establish the differences between the wrestlers. The analysis of the data obtained made it possible to note that no differences in the length, lower leg, forearm were found among the examined athletes, who were involved in the Turon wrestling. For example, the leg length for light weights is 41.3 ± 1.1, for average weights - 42.5 ± 3.9, for heavyweights - 41.5 ± 2.9. The forearm length was 27.3 ± 2.1 for lightweights with $\upsilon = 2.8$, for average weights - 26.2 ± 1.4 and for heavyweights - 27.2 ± 1.9.In this case, both the leg length and the forearm length do not depend on the weight category, and this fact can

be taken into account in sports selection for the Turonian. The exceptions were the length of the upper arm and forearm of heavyweights, for whom the length of the upper arm is prevalent, while the length of the forearm is as short. In addition, the length of the thigh in the light weight wrestlers is 48 ± 2.0, the middle weight Turonian (45.9 ± 3.0), and in the heavyweights - 47.3 ± 3.4. Regarding the leg length, it varies with the increase in the weight category among the Turonists. For example, in lightweights and middleweights - Turonists, this sign differs slightly, and in heavy weight categories, differences are clearly identified.This fact indicates that data on body proportions, apparently, have the greatest influence not only on the choice of technical actions, but also on the structure of their implementation. The value of the variability of the mass-growth index was $\upsilon = 11.6\%$.

CONCLUSION

The functional state of the Turonian type wrestlers is assessed positively in terms of physical performance and maximum oxygen consumption (MOC). A promising group of adolescent wrestlers was identified, whose functional state is characterized by high PWC-170 values and VO2 max. This group of athletes can be recommended for participation in international competitions.To study the differences in physique in the study group, the total and partial sizes of Turonists of various weight categories were assessed. To compose a general morphological picture of a Turonian wrestler, the length and weight of the body, the circumference of the chest, the length and girth of the lower leg and forearm, and the length of the body can be distinguished as integrative anthropometric features. Thus, individual anthropometric signs can influence the manifestation of special motor qualities of wrestlers.

	Full Name Turon		Physical development			Load power-kg / m / min		Phys. working capacity kg / m / min		YEL.	IGST	IPC l / mi	M рk	ДК прав. кисти		ДК левой .кисти	
		Rank	Height-cm	Weight-kg	MRI-g cm	Load No. 1	Load No. 2	PWC-kg / m / min	PWC-kg / m / min	liter	units	Abc.	Rel- ml / kg / mi	N-1	N-2	N-1	N-2
1	Normurodov.A	K.M.C	180	62	344,4	732,6	1008,3	1388,7	231,4	3.0	156,2	4.12	66.5	45	40	35	35
2	Elnazarov. M	K.M.C	177	89	502,8	1260,0	1270,3	1278,9	213.08	3,5	110,2	3,88	43,6	55	54	54	55
3	Abdurasulov. C	K.M.C	180	75	416,6	912,6	1228,5	1465.4	244,6	5,6	110,2	4,29	57,25	51	45	47	48
4	Ruzikulov. R	K.M.C	169	65	384,6	798,5	1041,8	1577,3	262,8	3,5	125	4,54	69,8	44	45	43	43
5	Normurodov. K	K.M.C	170	65	382,3	836,5	1125,5	**2021,4**	336,9	4,0	131,0	5.57	84,8	36	40	35	36
6	Ashurov. O	K.M.C	177	81	457,6	957,1	1137,3	**2094,4**	349.0	4,4	100	5,67	70,09	48	48	50	46
7	Ismatov. C	K.M.C	176	80	454,5	1104,4	1575,9	1443.7	240,6	5,3	93,7	4,24	53,0	45	50	46	48
8	Sult-V.Қ	MC	170	69	405,8	807,3	817,5	1654,81	275,8	4,1	123	4,71	68,2	41	40	33	35
9	Akbarov N	I-rank	170	63	370,5	958,2	1009,8	1064,5	177,4	3,5	113,6	3,41	54,15	40.4	51	40	50
10	Kengashov K	SUNK MS	179	73	407,8	1067,6	1264,0	1440,7	240,1	4,4	110,2	4,23	58,07	39	33	38	33
11	Tuxtaev A	K.M.S	167	57	341,3	646,8	933,6	1044,8	174,1	4,3	113,6	3,36	59,08	36	35	34	26
12	Mamatkulov A	I-rank	172	57	331,3	893,6	1133,73	1313,8	218,9	3,5	107,9	3,96	69,47	30,0	38	33,0	35
13	Yusupov J	K.M.C	181	71	392,2	764,2	1148	1129,4	188,2	4	119,0	3,55	50,06	41	33	45	40
14	Davronov A	I-P	175	54	311,4	701,4	1058,07	1315,58	219,2	3,7	98,68	3,96	75,7	38	42	38	37
15	Boymurodov SH	I-P	175	67	382,8	823,09	1262,08	**1606,68**	267,78	3,5	108	4,60	68,72	32	35	36	36
16	Ergashev B	M.C	165	67	406,06	1081,78	1230,72	1274,25	212,4	4,0	106,3	3,87	57,8	36	34	38	36
17	Eshonkulov X	SUNK , K.M.C	160	58	362,5	841,46	1017,09	1161,25	193,5	2,7	106,3	3,62	62,4	38	34	37	40
18	Tulamurodov I	I-P	169	67	396,4	440,68	1222,8	1269,72	211,62	3,4	120,9	3,86	57,66	33	40	35	44
19	Eshmurodov. B	I-P	178	68	382,0	914,94	1272,96	**1675,69**	279,28	3,4	102,7	4,75	69,94	30	32	33	40
20	Uralov. O	I-rank	174	83	477,0	1223,58	1524,62	1587,23	264,5	3,7	120,96	4,56	54,9	39	48	37	44
21	Turopov. M	I-rank	170	63	370,58	803,43	1076,16	1365,25	227,5	3,7	114,5	4,07	64,6	30	34	34	34
22	Maxmudov. Z	I-rank	184	76	415,0	1067,6	1241,9	1587.73	267.8	3,5	100.4	4.54	67.8	40	44	42	42
23	Zhonkeldiev, S.	MC	110	72	423,52	842,4	1053,0	**1663.7**	277,29	3,5	**113,6**	4,70	65,69	40	43	42	45
	X̄ ± σ		170,8 ±18,05	68,8± 8,2	396,48± 41,99	890,42±2 0.2,33	1558,55± 147,06	1434,97± 197,44	237,19± 34,72	3,8± 0,4	113,9±6 ,9	4,26 ±0,4 5	62,6±7,19	39,4± 4,07	40,8 ±5,0 3	39,3±3,6	40,3±5,2

Anthropometric
indicators of Turonists belonging to different weight categories (Table 2)
(up to 57 kg - light weight; from 58 kg to 75 kg - average weight; from 76 kg and more heavy weight

№	Full Name №-18 Turonists	Age	Sports rank	Body Weight (kg)	Body Height (Cm)	Girth chest (cm)	Torso length (cm)	M.R.I
1	Mamadkulov A .	16	K.M.C	57	172	86	91	331,3
2	Razhabov Z.	16	K.M.C	57	171	89	89	339,18
3	Tukhtaev A.	17	K.M.C	57	167	90	88	341,3
	Average $\overline{\text{X}} \pm \sigma$			**57 kg**	**170 ±2,6cm**	**88,3 ±2,08cm**	**89.3 ±1,5cm**	**337.2 ±5,2**
	v (%)			**0**	**1,5**	**2,3**	**1,7**	**1,6**
	Sultonmurodov Қ.	19	S.U.N	69	170	94	93	405,8
4	Eshonkulov Kh.	16	K.M.C	60	160	89	92	362,5
5	Normurodov A.	17	K.M.C	62	180	83	93	344,4
6	Normurodov K.	17	K.M.C	62	170	113	115	382,3
7	Davronov A.	19	I-rank	63	180	88	92	311,4
8	Akbarov N.	18	I-rank	63	171	91	95	370,5
9	Turopov M.	18	K.M.C	63	170	86	88	370,58
10	Ruzkulov A.	18	II-rank	65	169	88	92	384,6
11	Kurbonmurodov N .	19	S.U.N	65	170	91	91	382,3
12	Boimurodov S.	17	I-rank	67	175	88	90	382,8
13	Ermatov S.	16	I-rank	67	176	94	88	380,68
14	Ergashev B.	18	K.M.C	67	165	95	99	406,06
15	Elmurodov B.	17	K.M.C	67	178	91	96	382,0
16	Tilamurodov I.	17	I-rank	69	178	97	101	396,4
17	Yusupov Zh.	18	K.M.C	71	181	90	93	392,2
18	Zhongeldiev S.	19	M.C	72	170	97	87	425,52
19	Kengashev K.	16	K.M.C	73	179	92	95	407,8
20	Abdurasulov S.	17	K.M.C	75	180	98	95	416,6
21	Berdiev S.	19	M.C	65	175	100	93	382,3
22	Sultonmurodov Қ.	19	S.U.N	69	170	94	93	405,8
	Average $\overline{\text{X}} \pm \sigma$	**17.7 ±1,1**		**66.7±4**	**173,3±5,7**	**92,9±6.3**	**94 ±6**	**384.6±25,8**
	v (%)	**6,1**		**6**	**3,3**	**6,9**	**6,4**	**6,7**
	Heavyweights							
23	Ismatov S.	17	I-rank	80	176	96	94	454,5
24	Ashurov O.	17	K.M.C	81	177	98	89	457,6
25	Eshnazarov M.	18	I-rank	89	177	102	94	502,8
26	Makhmudov Zh.	19	M.C	107	178	119	96	601,1
27	Gulamov I	19	K.M.C	80	180	106	106	466.9
28	Abduraimov B.	19	K.M.C	77	175	93	94	455. 9
29	Ortikov I.	19	K.M.C	76	185	103	95	423,9
30	Makhmudov Z.	17	K.M.C	76	183	94	89	413,0
31	Uralov O.	19	I-rank	83	174	102	94	477,0
	Average $\overline{\text{X}} \pm \sigma$	**18,2±0,9**		**83,2±9,8**	**178,3±3,7**	**101,4±7,9**	**94,5±4,9**	**472,5±55**
	v (%)	**5,3**		**11,7**	**2,1**	**7,8**	**5,2**	**11,6**

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