UDC 796/799

ISSN (English ed. Online) 2311-6374
2016, № 1(51), c.74-84

Sport's selection of volley-ball players: morphological and pedagogical criteria of definition of movement endowments: (information 1)

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Purpose: *to define methodology of initial sports selection of young volley-ball players.*

Material & Methods: *methods of theoretical analysis and generalization, bibliographic method of search and study of scientific information, a systematic analysis are turned to account in this work.*

Results*: the article deals with the theoretical model of the mast important factors, which define sports endowments of volley-ball players. It is shown the point estimation of body structure and composition, motor and psychomotor abilities, dynamic possibilities, psychophisiological indices in the prognosis of volley-ball players gifted for high sports results.*

Conclusions: *criteria of high movement endowments of volley-ball players are defined; norms of estimation of motor abilities of valley-ball players on the initial steps of sports selection are given.*

Keywords: *sports selection, model characteristics, motor (movement) endowments, morphological signs, movement abilities.*

Introduction

Achievements of high sports results in world sport, including high achievements on the Olympic Games, are available to almost high-gifted sportsmen. The system of sports selection represents possibilities of the search of sports talented children and the prognostication of their potential abilities.

It is possible to note in modern conditions of development of sports science in general that the system of sports selection was created in many countries of the world: Ukraine [2; 13; 17; 18], Russia [6; 8; 16], USA [19; 21], Poland [15] and other countries. The training course for students of specialty physical education and sport of higher educational institutions of the level III-IV of accreditation is prepared in Ukraine. However many sports didn't receive due attention concerning scientifically caused concept of selection at its various stages yet. It is necessary to call the Olympic type among such sports – volleyball.

The characteristics which are defining success in this sports game are the following. Sportsmen-volleyball players (both men and women) must have the considerable total morphological sizes of a body, special proportions of segments of a body. Only sportsmen with high development specific to this game by the development of motive abilities can achieve good results: high-speed and power abilities, certain types of coordination abilities, anaerobic endurance. Psychomotor and mental features of the personality are important for volleyball players. High development of functional systems of an organism defines sports result: sensory, cardiovascular, etc. [7; 14].

However we will note that the consideration of methodology of sports selection of volleyball players, the definition of the most significant criteria for evaluation of motive endowments from positions of the development of modern sports science demand the further scientific development.

Communication of the research with scientific programs, plans, subjects

The work is performed according to the Consolidating plan of the research works in the sphere of physical culture and sport for 2011-2015 of the Ministry of Ukraine of family, youth and sport, the subject «Theoretic-methodical bases of individualization of the educational-training process in game sports» (No. of the state registration is 0112U002001).

The purpose of researches

To define methodology of the initial sports selection of young volleyball players on the basis of morphological and pedagogical criteria of sports endowments.

Material & Methods

Methods of the theoretical analysis and generalization, the bibliographic method of search and studying of scientific information, the system analysis were used in the work. As experts note, articles with the methodological orientation of consideration of any problem form a complete idea of a certain scientific direction and are strong incentive of future researches.

Results and discussion

Criteria which determine prospects of young sportsmen to classes by volleyball are the age, morphological features of a structure of a body, the development of certain motive abilities.

The age of volleyball players at various stages of long-term preparation. As believes T. O. Bompa [20], the basic selection of volleyball players has to be at the age of 10–12 years old. The age of special preparation (selection of capable and talented sportsmen) at volleyball players is – 15–16 years old. The age of achievement of good results – 22–26 years old.

However the age terms of the beginning of classes are accepted by volleyball in various countries. So, the age of basic selection of volleyball players is 6–7 years old in China and the USA, and in Russia – 9 years old [10].

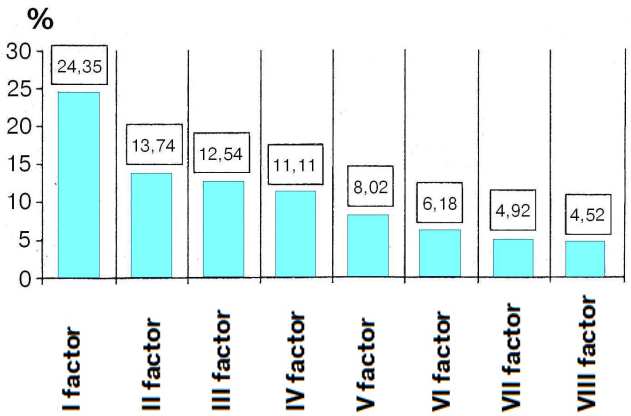
The age of volleyball players – participants of the Olympic Games – is given in tab. 1. We will note that woman reached high qualification in volleyball at younger age, than men. Winners of the Olympic Games have more considerably age in comparison with medalists and finalists of competitions at men. Such differences aren't observed at women.

Informational content of signs and abilities which are defined high sporting achievements of volleyball players. M. S. Bryl, S. Novarro [1] estimated informational content of morphological features, motive abilities and psychological characteristics in the system of sports selection in researches of young volleyball players at the age of 13–16 years old (tab. 2). A degree of informational content was determined by correlation coefficients between phenotypical manifestation of a sign and indicators of efficiency of the competitive activity. It is revealed that jump up from the place, difficult reaction, operational thinking, distribution of attention, level of claim, have a high informational content. A little smaller a degree of informational content is characteristic of indicators of length of a body, run on 5 m, kinesthetic sensitivity. And such morphological indicators have a moderate degree of informational content: body length with the raised hand, scope of hands, length of the top extremities; motive abilities: the explosive muscular force estimated by indicators of a long jump from the place and a throwing of a ball, high-speed abilities which are estimated by run on 20 m; psychological signs: simple motive reaction and functional activity of the visual analyzer (visual depth). Some of morphological indicators (body weight, length and width of a hand, active fatty body weight) aren't informative in the system of sports selection of volleyball players.

The importance of indicators in the system of special preparedness of highly skilled volleyball players can be estimated by results of the factorial analysis. S. V. Harkusha [5] having analyzed factorial structure of special preparedness of volleyball players of high qualification, have found the importance of the following factors (pic. 1):

- the leading factor (makes 24,35% of the general dispersion) are morphological indicators (lengths of a body and prolixity indicators of segments of a body);

- the factor which the author called «high-speed and power» (indicators of test tasks run by «fir-tree», run on 60 m, bending extension of hands in an emphasis lying belong) makes



Pic. 1. Factorial structure of special preparedness of volleyball players

13,74%;

- such indicators as body weight, thorax volume on a breath and an exhalation, the vital capacity of lungs belong to the third factor which makes 12,54% of the general dispersion of selection;

- the author characterizes the fourth factor as «the explosive force»: jump up from the place, long jump from the place and other kinds of jumps is characterized by tests. The contribution of this factor to the general dispersion of the selected data makes 11,11%;

- the indicators of heart rate belong to the fifth factor which the author called «a functional condition of cardiovascular system» (the factor makes 8,0% of the general dispersion of selection);

- the sixth factor called «the general force» (6,2%) – is defined by indicators of force of muscles of the right and left hands, pulling up on a crossbeam;

- the seventh factor characterizes a functional condition of respiratory system which makes 4,9% of the general dispersion of selection;

- the eighth factor characterizes ability to carry out the shock movements by hands (makes 4,5% of the general dispersion). It is estimated by the results of tests of a throw of a ball by two hands from behind a head, standing, sitting also in a jump.

The given abilities and indicators, in our opinion, are also informative in the system of sports selection of volleyball players.

Results of the above-stated researches allow us to build theoretically hierarchical model of informational content of certain signs and abilities (measurements and tests) which define sports endowments of volleyball players (tab. 3). the whole model makes 100 points on the analog with the American system [19].

Morphological indicators (organization of a body and structure of a body) – 35 points have the greatest mark assessment, then motive abilities – 31 points, further functional indi-

Table 1

The age of volleyball players (men and women) – participants of the Olympic Games of 1988 and 1996 [23]

The Olympic Games	Winners and participants	Number of the investigated	Age, years
	Men		
1988, Seoul	The USA	12	26,3
	Medalists	36	26,2
	Finalists, 1–8	96	25,8
	Places 9–12	48	25,1
	Total 1–12	144	25,5
1996, Atlanta	Нидерланды	12	27,8
	Medalists	36	25,9
	Finalists, 1–8	96	25,7
	Places 9–12	48	24,4
	Total 1–12	144	25,3
	Women		
1988, Seoul	USSA	12	23,7
	Medalists	36	23,8
	Finalists, 1–8	96	23,4
1996, Atlanta	Cuba	12	25,1
	Medalists	36	24,5
	Finalists, 1–8	96	25,3
	Places 9–12	48	24,7
	Total 1–12	144	25,1

Table 2

Informational content of morphological features, motive abilities and psychological characteristics in the system of sports selection of volleyball players

Indicators	Volleyball players of 13–14 years old (n=45)	Volleyball players of 15–16 years old	Degree of informativeness
	Morphological features		
Body length	0,649	0,562	xx
Body weight	0,016	0,102	
Body length with the raised hand	0,257	0,467	x
Scope of hands	0,224	0,304	x
Length of the top extremities	0,349	0,271	x
Length of a hand	0,017	0,072	
Width of a hand	0,032	0,015	
Active fatty body weight	0,241	0,124	
Fatty body weight	0,024	0,070	
	Motive abilities		
Long jump from the place	0,478	0,472	x
Jump up from the place	0,872	0,847	xxx
Throwing of a ball	0,485	0,603	x
Run on 5 m	0,732	0,776	xx
Run on 20 m	0,416	0,301	x
	Psychological characteristics		
Simple reaction	0,327	0,386	x
Difficult reaction	0,686	0,705	xxx
Operational thinking	0,706	0,739	xxx
Visual depth	0,411	0,441	x
Kinaesthetic sensitivity	0,347	0,590	xx
Distribution of attention	0,702	0,624	xxx
Level of claim	0,684	0,709	xxx

Note. *Reliable coefficients of correlation are emphasized. xxx – a high degree of informational content; xx – an average degree of informational content; x – a moderate degree of informational content.*

Table 3

Factors (indicators and abilities) which are defining endowments of volleyball players

The controlled system	Indicators	Tests	Assessment of a test, points
Organization of a body and structure of a body	Body length	Anthropometry	23
	Scope of hands		7
	Active body weight and constitution		5
Motive abilities	High-speed force:		
	feet	Jumps up and in length from the place	9
	hands	Ball throwing	5
	Maximum force	Hand dynamometry	3
	Power endurance	Pulling up on a crossbeam	3
	Coordination abilities	Shuttle run	5
	High-speed abilities	Run from 5 till 20 m	6
Functional abilities	Cardiovascular system	HR, AP and etc. Functional tests	10
	Respiratory system		8
Psychomotor abilities	Difficult motive reaction	Techniques of E. P. Ilyin	5
	Simple motive reaction		3
Psychophysiological indicators	Operational thinking	Psychophysiological techniques	3
	Kinestetic sensitivity		2
	Distribution of attention		3

Note. *Point total: 100 – owners of the gold Olympic medal; 90 – the Olympic team; 80 – the national team; 70 – the regional champion; 60 – the winner of local competitions; 10 – the viewer at competitions.*

Table 4

Total anthropometrical indicators of men's teams – participants of the 14th World Championship in volleyball [4], $\bar{X}\pm S$

Country	Anthropometrical indicators	
	Body length, sm	Body weight, kg
Algeria	191,6±3,18	83,2±5,62
Argentina	193,7±6,75	89,8±6,72
Australia	197,8±5,99	91,7±7,26
Brazil	196,7±6,51	87,4±7,67
Bulgaria	198,6±7,16	86,1±6,08
Canada	195,4±5,62	92,8±6,26
China	195,8±4,51	84,2±4,86
Cuba	197,3±4,62	87,7±6,51
Czech Republic	197,8±5,10	91,8±6,90
Egypt	193,5±7,55	89,7±8,29
Spain	195,9±4,78	88,8±6,53
Greece	197,8±3,90	87,6±4,68
Iran	191,4±6,44	84,3±6,93
Italy	195,9±6,19	87,3±5,30
Japan	191,3±9,01	81,7±7,43
Korea	193,2±7,23	81,9±6,03
Holland	198,7±5,85	90,4±5,73
Poland	200,0±7,09	89,9±6,65
Russia	201,2±6,97	91,7±6,96
Thailand	186,7±3,87	77,3±3,72
Turkey	197,0±4,31	84,9±5,90
Ukraine	199,7±5,11	93,8±7,88
USA	198,9±5,33	93,2±5,73
Yugoslavia	197,4±4,77	89,3±5,84
Average indicators of participants (n=429)	196,0±6,60	87,7±7,41

Table 5

Total anthropometrical indicators of men's teams – participants of the Olympic Games of 1988-1996 [23]

The Olympic Games	Winners, participants	Anthropometrical indicators of construction		
		Body length, sm	Body weight, kg	Ponderalis index, con. un.
1988, Seoul	The USA	193,9	88,3	43,56
	Medalists	194,8	89,6	43,57
	Finalists, 1–8	195,4	88,9	43,80
	Places 9–12	190,7	83,0	43,74
	Total 1–12	193,8	86,9	43,79
1992, Barcelona	Brazil	195,6		
	Medalists	197,0		
	Finalists, 1–8	195,6		
	Places 9–11	192,2		
	Total 1–11	194,6		
1996, Atlanta	Netherlands	201,6	93,0	44,50
	Medalists	198,7	90,8	44,20
	Finalists, 1–8	197,5	80,4	44,16
	Places 9–12	190,4	88,2	44,13
	Total 1–12	197,1	89,0	44,15

Note. *The ponderalis index pays off on a formula* $L = \frac{P, kg}{L, sm}$ *, where P – body weight, L – body length.*

Table 6

Total anthropometrical indicators of women's teams – participants of the 13th World Championship in volleyball [4], X±S

Country	Anthropometrical indicators	
	Body length, sm	Body weight, kg
Brazil	183,1±4,99	70,0±5,55
Bulgaria	184,4±4,64	68,6±6,97
China	182,3±3,76	72,2±3,99
Croatia	184,4±4,90	72,6±5,74
Cuba	180,6±4,95	71,3±5,01
Dominican Republic	186,2±5,55	69,5±2,83
Germany	185,4±4,91	72,7±8,50
Italy	182,6±5,45	71,6±6,41
Japan	178,8±6,06	67,7±5,60
Kenya	173,4±8,27	70,7±7,54
Korea	177,3±4,80	67,8±3,81
Holland	183,1±7,23	71,2±5,83
Peru	177,1±6,08	68,9±5,97
Russia	187,4±5,86	73,1±2,83
Thailand	174,1±5,06	63,2±4,88
USA	183,3±5,06	71,7±3,73
Average indicators of participants (n=285)	181,5±6,76	70,2±5,93

Table 7

Total anthropometrical indicators of women's teams – participants of the Olympic Games of 1988–1996 [23]

The Olympic Games	Winners, participants	Anthropometrical indicators		
		Body length, sm	Body weight, kg	Ponderalis index, c. u.
1988, Seoul	USSA	183,5	74,	46,69
	Medalists	180,3	70,9	43,62
	Finalists, 1–8	178,7	68,4	43,82
1992, Barcelona	Cuba	179,8		
	Medalists	181,1		
	Finalists, 1–8	180,1		
1996, Atlanta	Cuba	181,7	72,1	43,65
	Medalists	181,7	71,4	43,80
	Finalists, 1–8	182,4	72,1	43,82
	Places 9–12	178,3	68,7	43,58
	Total 1–12	181,0	71,0	43,74

Table 8

Length anthropometrical indicators of volleyball players of various game role (n=60), $\bar{X}\pm S$

Anthropometrical indicators	Players of the I temp	Players of the II temp	Libero	Binding players
Body length, sm	198,3±6,0	196,2±4,4	189,9±2,7	188,4±4,4
Length of a head, sm	29,4±1,2	29,2±1,5	29,9±2,1	28,9±1,0
Length of arms, sm	88,0±3,7	86,9±4,0	82,0±1,4	82,9±4,3
Length of legs, sm	104,3±5,1	101,4±3,6	97,1±3,2	97,4±3,9
Length of a trunk, sm	62,8±3,4	63,5±3,4	61,5±2,3	59,0±1,9
Length of a trunk, sm	36,5±2,2	35,6±1,7	34,3±1,9	34,4±2,1
Length of a forearm, sm	30,0±1,7	29,8±1,8	27,9±1,4	28,2±1,6
Length of a hand, sm	23,5±1,0	23,4±1,4	22,0±0,7	22,0±1,1
Length of a hip, sm	47,1±2,9	44,9±1,6	45,0±1,6	42,6±3,0
Length of a shin, sm	50,9±3,1	50,3±3,2	47,9±2,6	48,5±2,4
Length of a foot, sm	30,3±1,1	29,7±1,2	28,3±0,9	28,4±0,9

Table 9

Girth anthropometrical indicators of volleyball players

Anthropometrical indicators	Players of the I temp	Players of the II temp	Libero	Setters
Thorax circle (on an inhalation), sm	99,8±3,5	97,5±3,2	99,0±3,0	98,0±2,8
Thorax circle (on an exhalation), sm	97,5±3,3	91,0±3,5	94,5±2,9	89,0±3,0
Thorax shoulder, sm	28,8±1,7	28,5±1,5	30,5±1,1	28,5±1,2
Thorax forearm, sm	26,8±1,0	27,1±1,7	28,3±1,2	27,0±1,1
Thorax hip, sm	56,2±1,7	56,7±3,5	57,5±2,2	52,5±2,5
Thorax shin, sm	38,8±1,2	37,8±1,5	39,5±1,1	36,5±1,4

Table 10

Anthropometrical indicators of volleyball players of various age groups [12], $\bar{X}\pm S$

Anthropometrical indicators	Age group, years				
	13–14 (n=116)	15–16 (n=64)	17–18 (n=51)	19–20 (n=26)	21 … (n=32)
Length of a body, sm	172,98±7,85	182,07±7,03	186,84±7,00	194,44±5,94	192,28±5,60
Body weight, kg	58,41±9,85	69,16±10,78	74,74±9,41	81,64±6,76	84,72±8,18
Thorax circle (on a inhalation), sm	87,01±6,44	94,01±6,33	97,34±6,27	100,92±3,39	102,33±4,01
Thorax circle (on an exhalation), sm	79,20±6,12	85,66±6,00	89,07±6,26	92,26±3,56	94,41±4,42
Girth of a shoulder, sm	26,00±2,49	27,88±2,13	28,35±1,43	31,30±2,11	30,31±2,40
Grasp of a forearm, sm	23,92±1,89	25,69±1,52	26,33±1,03	28,20±1,25	28,19±0,75
Grasp of a hip, sm	48,07±3,69	50,70±3,79	51,88±3,11	55,20±4,97	55,50±3,15
Grasp of a shin, sm	35,01±2,03	36,44±2,15	36,70±1,76	39,10±1,24	38,56±0,68
Length of a head, sm	24,93±1,84	25,94±1,62	26,41±1,62	27,27±1,71	26,79±1,62
Length of a trunk, sm	54,82±4,94	59,06±3,75	60,63±2,90	61,57±5,69	63,00±3,67
Length of a hand, sm	75,36±4,59	79,11±4,13	82,13±3,27	85,17±3,37	84,17±2,92
Length of a shoulder, sm	30,53±2,21	32,17±2,12	34,06±1,91	36,43±1,98	36,50±1,72
Length of a forearm, sm	26,37±2,16	27,83±1,77	28,72±1,64	29,27±1,64	28,38±1,68
Length of a hand, sm	18,89±1,64	19,79±1,33	20,65±1,34	22,20±1,59	21,67±1,39
Length of a leg, sm	92,75±6,23	97,76±5,00	100,54±4,24	103,00±5,49	102,46±5,09
Length of a hip, sm	41,09±3,29	43,35±2,58	45,41±2,43	46,70±2,62	46,38±1,68
Length of a shin, sm	46,42±3,95	48,91±3,49	49,19±4,76	51,13±2,64	51,58±3,20
Length of a foot, sm	27,15±1,37	28,18±0,89	28,38±0,77	28,85±1,14	28,69±0,43

Table 11

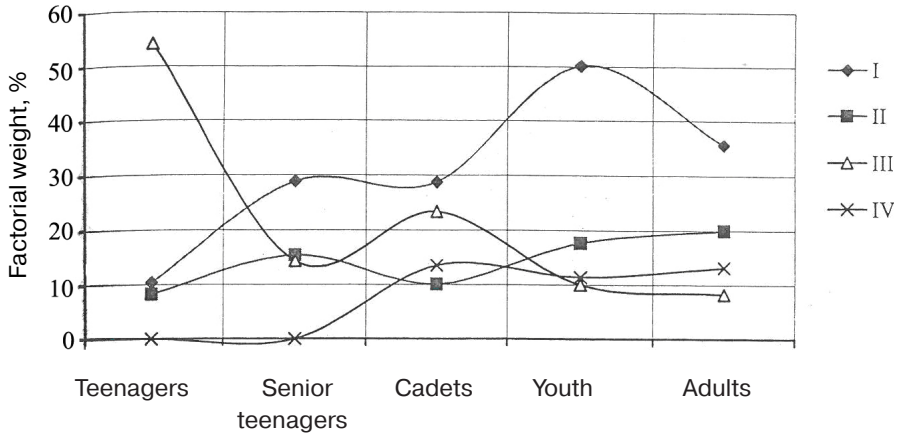
Model indicators of the development of motive abilities in volleyball players of high qualification [4]

Tests	Statistical indicators		
	X	±S	V
Coordination abilities			
Run by "fir-tree", s	24,55	1,61	6,57
Shuttle run of 4x9 m, s	8,93	0,48	5,33
Power abilities			
Jump up from the place, sm	54,65	7,90	14,45
Long jump from the place, sm	259,12	13,95	5,38
Jump up during the blocking, sm	301,18	11,33	3,76
Throw of a stuffed ball because of the head, sitting, m	14,62	2,08	14,25
Throw of a stuffed ball because of the head, costing, m	19,46	2,08	10,68
Throw of a stuffed ball because of the head, in a jump, m	17,05	2,16	12,69
Pulling up on a crossbeam	10,18	3,41	33,55
High-speed abilities			
Run on 60 m, s	8,01	0,29	3,68

Table 12

Model indicators of development of motive abilities in volleyball players of various age groups, $\bar{X}$±S [11]

Tests	Age group, years				
	13–14 (n=116)	15–16 (n=64)	17–18 (n=51)	19–20 (n=26)	21 … (n=32)
Long jump from the place	217,75±17,84	237,66±15,25	253,63±8,44	256,00±16,19	257,63±13,71
Jump up from the place, sm	51,91±6,50	58,47±5,63	62,05±5,56	55,25±9,08	56,81±7,15
Jump up from running start, sm	57,06±6,10	64,33±5,37	70,32±4,67	68,38±7,65	69,00±6,12
Shuttle run of 3x10 m, s	7,42±0,45	7,12±0,33	6,88±0,24	6,80±0,08	6,79±0,14
Shuttle run of 6x5 m, s	10,63± 0,67	10,06±0,26	9,80±0,19	9,69±0,14	9,72±0,16
Run by "fir-tree" (92 m), s	27,38±1,52	26,03±0,75	25,16±0,77	24,37±1,01	24,68±1,32
Run of 30 m from a high start, s	4,84±0,33	4,61±0,23	4,42±0,21	4,44±0,16	4,44±0,19
Run 10 s on the place, quantity of steps	52,32±5,94	54,05±6,19	57,47±6,25	54,38±3,78	53,56±3,52
Run of 5 min, m	1220,60±102,18	1258,95±91,82	1339,37±101,59	1403,75±58,29	1408,75±49,38
Throw of a ball of 1 kg, m	12,22±2,22	14,88±1,57	17,01±1,40	19,85±2,05	19,52±2,27
Throw of a ball of 1 kg sitting, m	7,12±1,46	8,70±1,29	10,62±2,64	14,34±2,28	14,49±2,18
Throw of a ball of 1 kg in a jump, m	10,17±2,33	12,94±1,34	14,58±1,45	16,81±2,18	17,00±2,48
Pulling up on a crossbeam, time	8,37±3,94	10,50±3,19	13,32±3,84	12,38±4,47	10,75±3,77



Pic. 2. Age dynamics of structure of physical preparedness of volleyball players [11]:
I – high-speed and power abilities; II – explosive force; III – coordination abilities; IV – special endurance

Table 13

Standards of an assessment of the development of motive abilities of volleyball players of various qualifications, $\bar{X}\pm S$

Tests	Sports qualification				
	Master of sport	Candidate of master of sport	I category	II category	III category
Run by "fir-tree", s	25,03±0,16	26,05±0,08	25,18±0,12	28,5±0,15	29,7±0,12
Throwing of a stuffed ball weighing 1 kg sitting, m	8,25±0,18	8,12±0,14	7,98±0,16	7,51±0,08	6,09±0,09
Throwing of a stuffed ball weighing 1 kg in a jump, m	12,96±0,21	12,7±0,16	12,53±0,24	12,43±0,17	9,03±0,17
Reaching of height in a jump, m	2,89±0,02	2,85±0,04	2,76±0,01	2,65±0,45	2,57±0,01
Jumping endurance, time	14,0±0,8	12,3±0,4	10,4±0,5	8,2±0,4	6,6±0,03

Table 14

Standards of an assessment of preparedness of women of master of sport on beach volleyball [3], $\bar{X}\pm S$

Tests	Standards of an assessment
Run on 30 m from a high start, s	4,3 and fewer
Run on 400 m, min	1,12 and fewer
Long jump from the place, sm	241 and more
Jump up from the place, sm	52 and more
Jump up from running start and pushing away of two legs, sm	60 and more
Pulling up in hanging on a crossbeam, time	8 and more
Throw of a stuffed ball weighing 2 kg two hands from behind a head, sm	571 and more
Shuttle run of 3x10 m, s	7,2 and fewer
Run by "fir-tree" (92 m), s	27,0 and fewer

cators – 18 points and close indicators of psychomotor abilities – 8 points and psychophysiological indicators – 8 points in the submitted table of an assessment of sports endowments of volleyball players.

Morphological model characteristics of volleyball players. We will make the characteristic of the total sizes of a body at highly skilled volleyball players according to participants of the World Cups (tab. 4) and the Olympic Games (tab. 5). Indicators demonstrate that the average length of a body of male volleyball players makes 196,0±6,60 sm. Length of a body of the highest team players of Russia made 201,2±6,97 sm. The average body weight of participants of the World Cup made 87,8±7,41 kg. The largest body weight appeared at men of the team of Ukraine: 93,8±7,88 kg. Comparing data of participants of the Olympic Games it is possible to note that length of a body of volleyball players of the victorious team increases over time. Similarly the body weight and the ponderalis index at sportsmen increase from the Olympic Games to the Olympic Games.

The total sizes of a body of women's teams on volleyball – participants of the World Championships are presented in tab. 6. Average indicators of length of a body of sportswomen made 181,5±6,76 sm. The women's team in which the average length of a body of participants was the greatest, was the team of Russia (187,4±5,86 sm). The team of Kenya was the lowest among participants of this championship (average age of volleyball players made 173,4±4,53 sm). Body weight averaged 70,2±5,93 kg. The team of Russia (73,1±2,83 kg) had the largest body weight. Volleyball players of the team of Thailand had the smallest body weight– 63,2±4,88 kg.

We will give also indicators of the total sizes of a body of participants of the Olympic Games (tab. 7). Differential distinctions on body length at volleyball players were from 178,3 sm till 183,5 sm, and body weight – from 68,4 kg till 74,2 kg. The ponderalis index was rather stable (43,58–43,82 c.u.).

According to S. V. Harkusha [4], volleyball players of high qualification of various role have differential distinctions both on length (tab. 8), and on girth indicators (tab. 9). Generally the most considerable data on length anthropometrical indicators are at players of the I and II speed in comparison with volleyball players of other roles (setters and libero). The most considerable grasps of the lower extremities are at libero for the girth of anthropometrical indicators.

The essential distinctions of anthropometrical indicators are observed in various age groups of volleyball players (tab. 10).

Table 16

Standards of an assessment of the development of length of a body and motive abilities at selection of volleyball players at the age of 11–15 years old and sports orientation at the age of 16–18 years old

Indicators	Age, years										
	11	12	13	14	15	16		17		18	
						P	A	P	A	P	A
Length of a body, sm	160	165	175	180	184	186	190	188	192	190	195
Run on 30 m from a high start, s	5,3	5,2	5,1	5,0	4,8	4,5	4,7	4,4	4,6	4,4	4,6
Shuttle run of 6x5 m, s	12,0	11,5	10,5	10,2	10,0	9,8	10,0	9,4	9,7	9,2	9,5
Run on 92 m (fir-tree test), s	29,0	28,0	27,0	26,5	26,0	25,5	26,0	24,2	24,8	23,4	24,0
Jump up from the place, sm	45	50	60	65	70	80	80	84	84	86	86
Jump up from running start, sm	50	56	66	72	78	84	88	90	94	92	96
Throwing of a stuffed ball of 1 kg or 2 kg from the provision of a set, m	5,0	6,2	7,2	8,0	9,0	9,5*	10,0*	12,0*	13,0*	13,5*	14,0*

Note. *P – playing, A– attacking volleyball players; * – the weight of a stuffed ball is 2 kg.*

Table 15

Standards of an assessment of abilities at selection of boys in volleyball, $\bar{X}\pm S$

Test	Age, years					
	10			11		
	Assessment					
	Excellent	Good	Satisfactorily	Excellent	Good	Satisfactorily
Run on 30 m from a high start, s	5,3	5,4–5,7	5,8–6,2	5,1	5,2–5,5	5,6–6,0
Run with change of the direction (6x5 m), s	12,0	12,2–12,4	12,5–12,8	11,8	11,9–12,2	12,3–12,6
Jump up from the place, sm	40	39–33	32–26	42	41–35	34–29
Long jump from the place, sm	165	164–150	149–140	186	185–168	167–150
Two hands costing a throwing of a stuffed ball (1 kg) from behind a head, m	11	10–9	8–6	13	12–10	9–8
Throwing of a tennis ball, m	24	23–20	19–16	26	25–22	21–18

These indicators can be estimated as model characteristics of volleyball players of various age groups.

Model characteristics of the development of motive abilities of volleyball players. As it was noted earlier, the indicators estimating the development of high-speed abilities and high-speed strength of children and teenagers can be informative in the system of sports selection. Practice shows that it is important to estimate as well a predisposition to the development of coordination abilities at a sports selection. Model indicators of the development of these abilities in volleyball players of high qualification are presented in tab. 11. And model indicators of the development of motive abilities of volleyball players of various age groups are given in tab. 12.

The predictive importance of various factors of volleyball players can change with age (pic. 2). So, the highest prognostication of coordination abilities is at youthful age, and during other age periods – explosive force. Special endurance isn't informative in two age periods of youthful age. Since cadet age, the factorial weight of this ability increases.

E. V. Kudryashov [9] recommends using the following standards of an assessment of the development of motive abilities at female volleyball players at various stages of a sports selection (tab. 13).

The standards of an assessment of the development of high-speed, power and coordination abilities, which are presented in the table 14, can be used at a sports selection of volleyball players in national teams of beach volleyball.

Standards of an assessment of motive abilities of volleyball players at the initial stages of a sports selection. Yu. D. Zheleznyak [2] recommends using the program consisting of 6 tests with a three-point scale of an assessment at the initial stages of a sports selection of boys at the age of 10–11 years old in Russia (tab. 15). In Poland W. Jagiello [22] recommends to use the program and standards of a differential assessment at selection of volleyball players at the age of 11–15 years old and sports orientation at the age of 16–18 years old, which are presented in tab. 16.

The above-stated material allows allocating the following **criteria** of determination of motive endowments of volleyball players (men and women). Morphological criteria:

- body length;
- scope of hands;
- features of a structure of a body (active body weight and constitution);
- ratio of length sweeps of various parts of a body.

Pedagogical criteria (criterion of the development of motive abilities):

- power abilities (high-speed force («explosive force»), power endurance, maximum force of separate groups of muscles);
- high-speed abilities (starting speed, remote speed on a short site of a distance);
- coordination abilities (ability to differentiate existential parameters of movements; perception of space; perception of power parameters of movements; spatial and dynamic sensitivity);
- positive dynamics of sports working capacity (sports results);
- optimum age of sports selection and dynamics of sports results;
- high «training» of a sportsman (high adaptation abilities of sportsmen).

Methodological basis of a sports selection of volleyball players is the realization of the following practical tasks:
- formation of model of a high-class sportsman-volleyball player;
- prediction of features of maturing of morphological indicators and development of motive abilities (short-term and long-term);
- organization of a sports selection (regulation of duration of various stages of a sports selection) and distribution of tests at these stages.

Conclusions

1. The generalized concept of sports selection of volleyball players is created.

2. The most significant factors (indicators and abilities) are defined, which are defining endowments of volleyball players. The theoretical mark model of an assessment of a constitution and structure of a body, motive and psychomotor abilities, functionality, psychophysiological indicators is presented in the prediction at volleyball players of predisposition to high sports results.

3. Criteria of high motive endowments of volleyball players are defined.

4. Standards of an assessment of motive abilities of volleyball players are given in the initial stages of a sports selection.

Prospects of further researches

Are connected with the definition of genetic criteria of a sports selection of volleyball players. In particular, they can concern genealogical data, definition of genetic markers of high sports endowments of volleyball players.

Conflict of interests. The authors declare that there is no conflict of interests.
Financing sources. This article didn't get the financial support from the state, public or commercial organizations.

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Received: 15.01.2016.
Published: 28.02.2016.

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