

MORPHOLOGICAL CHARACTERISTICS OF AEROBIC GYMNASTICS COMPETITORS IN AGE ASPECT

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(Original scientific paper)

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Abstract:

It was held testing on physical development of Aerobic Gymnastics competitors in age aspect regarding gender and competition structure of FIG. The tested people are divided by gender into five competitive-age groups from 7 to over 18-year-old. It is used standard methodology of Bulgarian Academy of Science (BAS) for anthropometric tests of the Bulgarian population. The results can be used for comparison of data of the same age groups – children (7-8, 9-11 and 12-14-year-old), youths (15-17-year-old), men and women (over 18-year-old) put into different training and competition conditions.

Key words: *anthropometry, testing, different sexes, training, arithmetic mean*

INTRODUCTION

The morphological characteristic of the competitors carries information about norms and tendencies in physical development and suggests what should be the selection and character of sports training. Higher possibility for evaluation gives the anthropometric testing held regarding the age, gender and qualification.

In the field of Sport Aerobics, as relatively young sport (from 1995), the testing is partial. That gave us reason to held researches on physical abilities of Sport Aerobics competitors in age aspect regarding the gender and competition structure of FIG. We divided the tested competitors into five Age Groups: I and II Age Group – children (7-8-year-old) and (9-11-year-old); III Age Group – girls and boys (12-14-year-old); IV Age Group – youths (15-17-year-old) and V Age Group – men and women (over 18). The number of the tested competitors is in Tables 1 and 2.

METHODS

The testing was held:

For 7-8-year-old children – before and at the end of the pedagogical experiment – V. Tarnovo – 2004/2005.

For 9-11-year-old children – additional

researches 2008/2009, a part of the children are from the participants in the pedagogical experiment.

For youths 12-14 and 15-17-year-old Aerobic Gymnastics competitors – during the First FIG International Age Group Competition, 27-30 May, 2004 - Sofia.

For men and women (competitors over 18 years) during the II Balkan Games (2-4 November, Sofia, 2001), VII World Championship in 2002 (25-28 July, Klaipeda, Lithuania) and X World Championship in 2008 (22-27 April, Ulm, Germany).

It is used standard methodology of Bulgarian Academy of Science (BAS) for anthropometric researches and for defining the motor skills and abilities of Bulgarian population

Calipermetrics (skin folds testing)-SF4 - triceps – mm, SF5 – subscapula – mm, SF7 - abdomen – mm, SF11 – biceps – mm, SF12 – front thigh – mm, SF13 – medial (mid-calf) – mm, SF14 – iliac crest – mm, sum of 7 Skin folds (SOS7) – mm;

Lengths – Standing Height – cm и Seated Height – cm; Girths – Chest – cm, Waist Girth – cm, Gluteal Girth (contracting and relaxed) – cm, Forearm Girth – cm, Thigh Girth (Th) – cm, Calf Girth – cm, Waist to Hip Ratio (WHR); Body

Table 1. Anthropometric indexes.

Age (years)	Number tested (263)	Index	Skin folds (mm)								Height (cm)		Girths (cm)							Diameters (cm)		Weight (kg)
			4	5	7	11	12	13	14	?SF	Standing	Seated	Chest	Waist	Arm contr.	Arm relaxed	Forearm	Thigh	Calf	AD	TD	
7-8	40	Öav	11,9	7,5	13,1	7,1	14,7	13,8	17,3	85,4	124,1	-	59,3	54,4	20,5	19,5	17,2	36,1	25,7	5,1	7,0	22,8
9-11	16		9,8	6,9	8,3	4,9	10,3	9,8	5,7	55,7	142,6	74,6	64,6	55,9	21,9	20,5	19,8	41,8	28,5	5,5	7,8	32,7
12-14	92		10,1	7,2	9,0	5,3	12,9	9,3	6,3	60,1	154,7	81,4	69,2	61,3	24,7	22,7	21,7	47,2	31,4	6,0	8,4	44,1
15-17	82		10,9	8,7	10,9	5,6	14,8	10,5	7,6	69,0	159,2	85,2	71,9	64,2	26,7	24,3	22,5	51,5	33,5	5,9	8,3	50,9
18+	33		8,7	8,5	4,6	4,2	4,8	7,1	3,7	41,6	161,9	-	73,8	66,1	27,6	25,9	22,5	53,0	34,5	5,5	8,1	51,1
7-8	40	Söav	1,2	1,3	3,6	0,7	2,8	1,0	6,4	12,4	3,8		3,0	3,8	0,5	0,8	0,8	1,3	1,7	1,0	0,4	2,1
9-11	16		2,7	1,5	1,6	0,9	2,2	2,1	1,4	1,8	6,7	3,7	3,8	4,1	2,2	2,1	1,7	4,5	2,7	0,5	0,6	5,8
12-14	92		3,0	1,8	3,3	1,8	3,7	2,5	2,1	2,6	7,8	4,8	5,9	4,2	2,3	2,2	1,9	4,0	2,5	0,5	0,5	7,5
15-17	82		3,1	2,2	4,2	1,8	4,0	2,6	2,8	2,9	5,9	3,4	5,6	3,9	1,9	3,1	1,3	3,8	2,5	0,5	0,4	5,9
18+	33		4,3	2,4	2,0	2,0	3,4	2,8	1,3	2,6	4,9	-	4,5	4,2	1,8	1,5	1,6	2,9	1,8	0,4	0,9	4,7

Aerobic Gymnastics - women from 7 to over 18-year-old

Table 2. Anthropometric indexes
Aerobic Gymnastics – men from 7 to over 18-year-old

Age (years)	Number tested (71)	Index	Skin folds (mm)								Height (cm)		Girths (cm)							Diameters (cm)		Weight (kg)
			4	5	7	11	12	13	14	?SF	Standing	Seated	Chest	Waist	Arm contr.	Arm relaxed	Forearm	Thigh	Calf	AD	TD	
7-8	20	Öav	12,1	7,2	12,3	6,8	15,1	12,9	17,2	83,6	125,8	-	59,1	55,1	20,3	19,3	16,9	36,4	25,6	5,4	7,2	23,6
9-11	7		9,4	5,9	8,7	6,1	10,1	9,8	5,7	55,8	135,8	72,1	64,4	56,2	21,2	19,8	19,3	39,0	27,5	5,5	7,9	30,7
12-14	15		9,6	7,6	8,2	5,4	11,3	9,1	6,4	57,7	154,3	80,9	70,8	63,9	24,7	22,9	21,6	48,1	32,2	6,3	8,5	44,9
15-17	16		6,9	7,2	6,7	3,7	8,3	7,2	5,8	45,8	167,3	88,3	80,1	67,1	28,9	25,9	24,2	49,1	33,7	6,8	9,2	55,5
18+	13		6,8	8,3	4,6	3,5	6,3	6,0	4,0	39,5	173,5	-	87,0	74,8	33,1	29,6	26,1	53,0	36,0	6,8	8,7	64,6
7-8	20	Sxav	0,8	1,3	3,8	0,6	2,2	0,9	7,7	17,2	4,0	-	3,1	7,1	0,5	0,7	0,2	1,2	0,4	1,1	0,4	2,9
9-11	7		1,9	1,3	1,9	1,6	4,0	2,7	1,5	15,0	4,0	1,0	1,3	2,4	0,9	1,0	1,4	2,3	2,0	0,6	0,5	2,8
12-14	15		2,1	1,6	2,3	1,5	3,1	2,0	2,0	14,6	9,0	4,6	2,2	2,9	1,6	1,2	1,3	3,5	2,1	0,6	0,7	6,5
15-17	16		1,9	1,4	1,9	0,7	2,3	2,9	1,6	12,8	8,5	4,7	7,5	4,6	2,9	2,9	1,8	4,5	2,9	0,3	0,4	10,3
18+	13		1,8	1,2	1,4	1,5	4,0	2,1	0,8	12,7	2,7	-	5,4	4,1	2,6	2,1	1,5	1,7	1,7	0,6	1,0	3,6

Diameters – diameter os. humeri – cm and diameter os. femoris – cm; Weight (Wt) – kg.

The mathematical-statistical analysis of the gathered data for all five age groups we processed with special computer program developed by eng. N. Yordanov, NSA, “V. Levski”.

RESULTS

Quantity of the indexes characterising the physical ability depends on much and various factors. They can be combined in two basic categories – *general factors* and *specific factors*. *General fac-*

tors (age, gender, pubertal stage development, etc.) have unidirectional effect over the indexes. They help for their increase or decrease. Thus, for example, gender has an effect over height, weight, girths, etc.

Specific factors have semidirectional effect – in one case can cooperate for increasing the indexes, and in other – for their decreasing. Specific factors in our research are the training and competition influences, over Aerobic Gymnastics competitors' organism.

Lengths and Proportions

Standing height is typical index for physical development of human during its whole life. On Table 1 and 2 are the average values (X_{av}) and the standard deviation (S_{xav}) of this index for each age-gender competitors' group. *Seated height* could be used to define the length of the body, lower limbs and body proportions.

Differences in physical development between I and II, III and IV Age Groups are bigger than that between IV and V Age Groups. That could be explained with the pubertal stage and the fast growth during this age. As a whole can be observed progressive height changes till 18 years age of Aerobic Gymnastics competitors.

I age group 7-8-year-old boys and girls are with almost the same height. In the beginning of the pre-pubertal stage (II group – 9-11-year-old) they increase their height with 10 cm. The highest growth (13 cm) is between the III (12-14) and IV (15-17) when children from growing up pass to youths.

Body mass and girths

Weight shows summed its mass and characterizes bones development, internal organs and body mass (Tables 1 and 2). Development of body mass has significance not only for the features and changes in growth of children and youths, but also for rationalizing the training, nutrition and overall condition of life and rest of Aerobic Gymnastics competitors. The development of the body mass we defined by its direct testing. For women the differences in weight has tendency for increasing from 7 to 15-17-years-old. After 17-year-old the tendency is to remain the same mass – about 51 kg. For men the tendency is to permanent increasing of kilos to 18 years-old – from 23,6 kg (7-8-years-old) to 64,4 kg (over 18-years-old).

In order to define that the directly tested body mass carries information for optimal weight of Aerobic Gymnastics competitors it was necessary to be determined by various body girths.

Body Girths, especially the waist and hip girths are closely related to the body mass. *Chest girth* is morphological and functional index. The increasing of its values could be as a result of improving of breathing capacity of lungs or increasing of body mass. By upper limbs and hip girths were précised

some features in the development of muscle mass of Aerobic Gymnastics competitors. The determined difference from two consecutive tests on arm girths (contracted and relaxed) characterizes the development of muscle mass of children (7-8-year-old) and for the rest of the Aerobic Gymnastics competitors – Tables 1 and 2.

CONCLUSION

Increasing of height, weight, girths and diameters in age aspect of decreasing of skin folds and their sum (SF) is an index for good physical development and progressive muscles' development.

All indexes related to physical development of Sport Aerobics competitors can be used for comparison of data for the same age groups children (7-8, 9-11, 12-14-year-old), youths (15-17-year-old), men and women (over 18 years) put into different training and competition conditions.

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МОРФОЛОШКИ КАРАКТЕРИСТИКИ НА НАТПРЕВАРУВАЧИТЕ ВО СПОРТСКИ АЕРОБИКА СПОРЕД НИВНАТА ВОЗРАСТ

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(Оригинален научен труд)

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Апстракт:

Испражувањето е спроведено врз физичкиот развој кај најпреварувачките во спортски аеробик според нивната возраст и пол во согласност со најпреварувачката структура на Меѓународната Гимнастичка Федерација (FIG). Испитаниците беа распоредени според нивниот пол во пет најпреварувачки возрастни групи од 7 до над 18 -годишна возраст. За мерењето на физичкиот развој на испитаниците беше применета стандардната методика на Бугарската академија на науките (BAN) за антропометриски мерења на бугарското население. Добитните резултати од испражувањето можат да се користат за споредба на податоците за физичкиот развој во сите возрастни групи: деца (7-8, 9-11 и 12-14 години), мажи и жени (15-17 години и над 18 години), кои се применети во различни тренижни и најпреварувачки услови.

Клучни зборови: *антропометрија, тренирање, различен пол, тренинг, антропометричка средина*