

Characteristics of the leading factors of special physical preparedness of athletes from acrobatic rock and roll at the stage of preliminary basic training

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Purpose: analysis of the leading factors of special physical fitness of athletes from acrobatic rock and roll at the stage of preliminary basic training.

Material & Methods: 10 sports couples took part in the study (10 male partners, 10 female partners). The research methods are: theoretical analysis and synthesis of data from special scientific and methodological literature; pedagogical testing methods; methods of mathematical statistics (factor analysis).

Results: the analysis of the identified factors of special physical fitness of athletes-Juvenal at the beginning of the pedagogical experiment was conducted and their redistribution in the factor structure of preparedness at the end of the pedagogical experiment was established.

Conclusions: it was found that for male partners and female partners the determining factors are: speed-strength, coordination; anthropometric; functional preparedness. The results of the analysis of the factor structure of preparedness of athletes from acrobatic rock-and-roll testifies to the significant impact of the use of the developed speed-strength patterns, motor coordination and functional training on the special and competitive preparedness of juvenile athletes at the stage of preliminary basic training.

Keywords: acrobatic rock and roll, factors, analysis, preparedness, juvenile athletes.

Introduction

It is known that improving the athletic performance of athletes at the stage of preliminary basic training is possible only if objective data are available, taking into account the characteristics of training and the structure of athletes' preparedness [2]. Features of modern sports training, which is characterized by high intensity of muscle activity, determines the search for factors and conditions that determine the training of athletes [3; 4]. The regularity of the formation of adaptation to the factors of training impact and the formation of differences in the components of sportsmanship provide at each new stage of improvement the presentation to the body of athletes of requirements close to the limit of their functional capabilities is crucial for the effective flow of adaptive processes [9; 11]. An important aspect of the management processes of such a complex dynamic system, like acrobatic rock and roll, is the principle of feedback, according to which successful management can be carried out only if the trainer receives information about the effect achieved under his influence on the athlete [1; 4; 10]

Purpose of the study: analysis of the leading factors of special physical preparedness of athletes from acrobatic rock and roll at the stage of preliminary basic training.

Objectives of the study:

1. To study the problem of special physical preparedness of juvenile athletes from acrobatic rock and roll at the stage of preliminary basic training.

2. To determine the leading factors of special physical preparedness of juvenile athletes from acrobatic rock and roll at the stage of preliminary basic training

Material and Methods of the research

The study involved 10 sports couples (10 male partners, 10 female partners) from an acrobatic rock and roll category "Juvenile", whose training and training process at the preliminary basic training stage included exercises of speed-strength orientation and functional training (integral set of exercises) [3]. With the help of factor analysis, the influence of the developed technique on the special and competitive readiness of the juvenile athletes (male partners) was investigated.

Research methods: theoretical analysis and synthesis of data from special scientific and methodological literature; pedagogical testing methods; methods of mathematical statistics (factor analysis) using the universal statistical package "STATISTICA".

To determine the factor structure of special physical fitness of athletes of the Juvenal category in acrobatic rock-and-roll and the dynamics of its change under the influence of an

experimental technique, a factor analysis was conducted of 7 indicators of special physical fitness (T1 – "2 somersaults forward, 1 somersault back, "tour" for 30 seconds (number of times)"; T2 – "Performing the main move in 20 seconds (number of times)"; T3 – "Lower change with the rotation of the female partner at 540° (number of times)"; T4 – "Top change with the turn of the partner at 720° in American spin (number of times)"; T5 – "Lower, upper change, tour anler (in the air) for 360° (number of times)"; T6 – "Lower, upper change, the female partner jump up with the support of the male partner's hands (number of times)"; T7 – "Performing competitive program in nonstop (number of times)"), 3 indicators of functional preparedness (the girth of the chest in a rest condition (cm), the index Rufie (c. u.), VC, ml) and anthropometric indices (18 indicators in total) at the beginning and at the end of the pedagogical experiment. Given the fact that acrobatic rock'n'roll is a pair of sports, then factor analysis was conducted separately for each of the partners of the sports pair. But despite this, each of them is a component of a single process of competition aimed at achieving a high sporting result [5–7]. The initial data of the factor analysis did not include the parameters of psychological, tactical and other types of athletes' preparedness, which are concomitant with special physical preparedness and also affect the athletic performance in acrobatic rock and roll. Based on the purpose of our work, in this aspect, indicators of special physical fitness, anthropometric indicators and indicators of the Ruffier index were taken into account, which play a major role in the technique of performing elements (movements) in a pair [8; 10].

Results of the research

According to the data obtained [3], in the group of juvenile athletes (male partners) 4 factors were revealed (Table 1).

In Fig. 1 shows the factor structure of indicators of special physical preparedness of athletes Juvenal (male partners) of the experimental group at the beginning of the pedagogical experiment. This structure explains 82,1% of the total variance, which indicates its adequacy. 17,9% of the total variance accounted for by other parameters that were not included in the output of the factor analysis.

The factor structure obtained from the analysis of data from

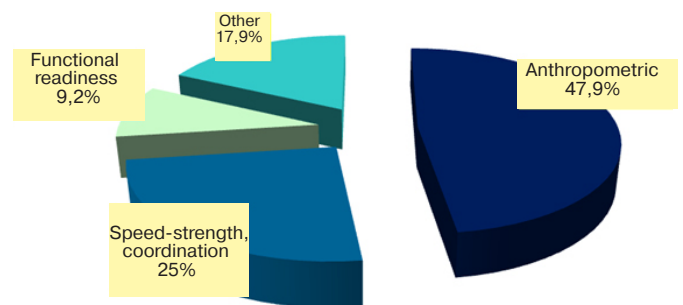


Fig. 1. Factor structure of special physical preparedness of athletes (male partners) of the "Juvenal" category of the experimental group at the beginning of the pedagogical experiment

Table 1
Factor structure of fitness of athletes of the category "Juveniles" from acrobatic rock and roll (male partners) at the beginning of the pedagogical experiment

Name of the factor, the total contribution to the variance	Indicators	Factors			
		1	2	3	4
1. Anthropometric, 47,9%	Length of the right hand, cm	0,97	–	–	–
	Length of the left leg, cm	0,97	–	–	–
	Length of the left lower leg, cm	0,93	–	–	–
		0,95	–	–	–
	Length of the right thigh, cm	0,80	–	–	–
	Girth of the left hip, cm	0,98	–	–	–
	Girth of the left shin, cm	0,88	–	–	–
	Body weight, kg	0,98	–	–	–
2. Speed-strength, coordination, 25,0%	Body length, cm	0,99	–	–	–
	T1. 2 somersaults forward, 1 somersault back, "tour" for 30 seconds (number of times)	–	0,82	–	–
	T2. Performing the main move in 20 seconds (number of times)	–	0,88	–	–
	T4. Top change with the turn of the partner at 720° in American spin (number of times)	–	0,71	–	–
	T5. Lower, upper change, tour anler (in the air) for 360° (number of times)	–	0,83	–	–
3. Functional readiness, 9,2%	T6. Lower, upper change, the partner jump up with the support of the partner's hands (number of times)	–	0,94	–	–
	Chest girth at rest, cm	–	–	0,98	–
	VC, ml	–	–	0,78	–
4. Other – 17,9%	Rufie Index (c. u.)	–	–	–0,67	–

partners of the experimental group of juvenile athletes explains 77,4% of the total variance (Table 2, Figure 2).

The factor structure obtained from the results of the analysis of the experimental data of the group of athletes Juvenal

Table 2
Factor structure of fitness of athletes of the category "Juveniles" from acrobatic rock and roll (female partners) at the beginning of the pedagogical experiment

Name of the factor, the total contribution to the variance	Indicators	Factors			
		1	2	3	4
1. Anthropometric, 45,4%	Length of the left hand, cm	0,71	–	–	–
	Length of the right leg, cm	0,98	–	–	–
	Length of the right lower leg, cm	0,90	–	–	–
	Length of the right foot, cm	0,89	–	–	–
	Girth of the right shin, cm	0,79	–	–	–
	Body weight, kg	0,70	–	–	–
	Body length, cm	0,93	–	–	–
2. Speed-strength, coordination, 20,7%	T1. 2 somersaults forward, 1 somersault back, "tour" for 30 seconds (number of times)	–	0,90	–	–
	T2. Performing the main move in 20 seconds (number of times)	–	0,78	–	–
	T3. Lower change with the rotation of the partner at 540° (number of times)	–	0,75	–	–
	T5. Lower, upper change, tour anler (in the air) for 360° (number of times)	–	0,72	–	–
	T6. Lower, upper change, the partner jump up with the support of the partner's hands (number of times)	–	0,70	–	–
	T.7. Performing competitive program in nonstop (number of times)	–	0,85	–	–
	3. Functional readiness, 11,3 %	Chest girth at rest, cm	–	–	0,81
VC, ml		–	–	0,79	–
Rufie Index (c. u.)		–	–	–0,90	–
4. Other – 22,6 %					

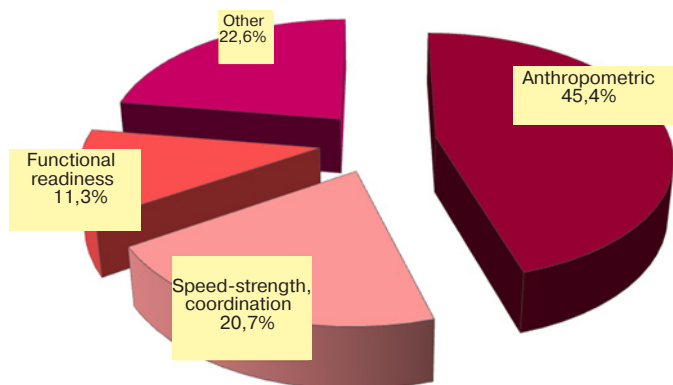


Fig. 2. Factor structure of special physical fitness of athletes (female partners) of the "Juvenal" category of the experimental group at the beginning of the pedagogical experiment

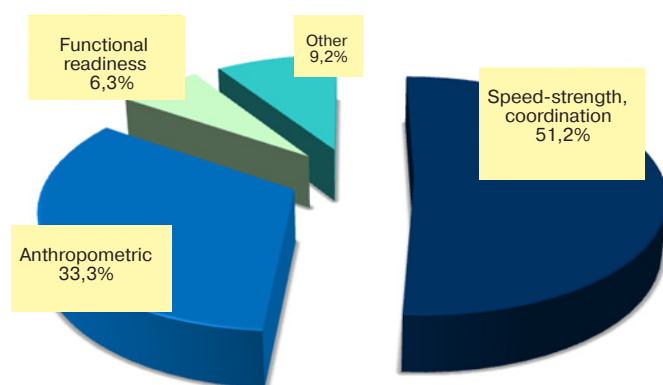


Fig. 3. Factor structure of special physical preparedness of athletes (male partners) of the "Juvenal" category of the experimental group at the end of the pedagogical experiment

(male partners) after the pedagogical experiment explains 90.8% of the total variance (Table 3, Figure 3).

Thus it was established that during the period of the training process, the redistribution of the significance of factors into partners took place. The speed-strength factor, coordination factor (51,2%) came out on top, the anthropometric factor came in second place, which has a percentage ratio to the total variance of 33,3%, the third place was left to the factor of functional readiness with a percentage ratio to the total vari-

ance 9,2%, the fourth factor has incorporated other indicators of preparedness and has a percentage of the total variance – 6,3%. The redistribution of the importance of factors among the male partners testifies to the significant influence of the use of developed speed-strength orientation complexes and functional training (integral complex of exercises) developed in the training process on the special and competitive preparation of athletes-juvenals (male partners) in the stage of preliminary basic training.

Table 3

Factor structure of fitness of athletes of the category "Juveniles" from acrobatic rock and roll (male partners) at the end of the pedagogical experiment

Name of the factor, the total contribution to the variance	Indicators	Factors			
		1	2	3	4
Speed-strength, coordination, 51,2%	T1. 2 somersaults forward, 1 somersault back, "tour" for 30 seconds (number of times)	0,81	-	-	-
	T2. Performing the main move in 20 seconds (number of times)	0,97	-	-	-
	T3. Lower change with the rotation of the partner at 540° (number of times)	0,89	-	-	-
	T4. Top change with the turn of the partner at 720° in American spin (number of times)	0,92	-	-	-
	T5. Lower, upper change, tour anler (in the air) for 360° (number of times)	0,71	-	-	-
	T6. Lower, upper change, the partner jump up with the support of the partner's hands (number of times)	0,85	-	-	-
	T.7. Performing competitive program in nonstop (number of times)	0,94	-	-	-
Anthropometric, 33,3%	Length of the right hand, cm	-	0,87	-	-
	Length of the left leg, cm	-	0,88	-	-
	Length of the left lower leg, cm	-	0,84	-	-
	Girth of the left hip, cm	-	0,88	-	-
	Girth of the left shin, cm	-	0,88	-	-
	Body weight, kg	-	0,77	-	-
	Body length, cm	-	0,77	-	-
Functional readiness, 6,3%	Chest girth at rest, cm	-	-	0,71	-
	VC, ml	-	-	0,73	-
	Rufie Index (c. u.)	-	-	-0,65	-
Other – 9,2%					

In the factor structure of the preparedness of the female partners of the experimental group after the pedagogical experi-

ment, four factors were identified that explain 83,7% of the total variance (Table 4, Figure 4).

Table 4

Factor structure of fitness of athletes of the category "Juveniles" from acrobatic rock and roll (female partners) at the end of the pedagogical experiment

Name of the factor, the total contribution to the variance	Indicators	Factors			
		1	2	3	4
Speed-strength, coordination, 42,7%	T1. 2 somersaults forward, 1 somersault back, "tour" for 30 seconds (number of times)	0,95	-	-	-
	T2. Performing the main move in 20 seconds (number of times)	0,95	-	-	-
	T3. Lower change with the rotation of the partner at 540° (number of times)	0,90	-	-	-
	T6. Lower, upper change, the partner jump up with the support of the partner's hands (number of times)	0,84	-	-	-
	T.7. Performing competitive program in nonstop (number of times)	0,90	-	-	-
Anthropometric, 30,5%	Length of the right hand, cm	-	0,82	-	-
	Length of the left leg, cm	-	0,85	-	-
	Length of left foot, cm	-	0,87	-	-
	Girth of the left shin, cm	-	0,88	-	-
	Body weight, kg	-	0,91	-	-
	Body length, cm	-	0,85	-	-
Functional readiness 10,5%	Chest girth at rest, cm	-	-	0,74	-
	VC, ml	-	-	0,83	-
	Rufie Index (c. u.)	-	-	-0,75	-
Other – 16,3%					

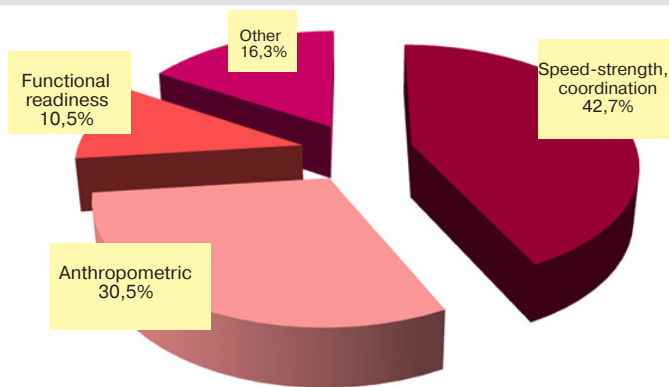


Fig. 4. Factor structure of special physical preparedness of athletes (female partners) of the "Juvenal" category of the experimental group at the end of the pedagogical experiment

An analysis of the factor preparedness of female partners before and after the pedagogical experiment also showed a redistribution of the significance of factors. In the first place should be the factor of speed-strength, coordination (42,7%), in the second place is the anthropometric factor, which is 30,5% as

a percentage of the total variance explained. The third factor of *functional readiness* decreased by 0,8% and is 10,5%. The total contribution of the factor structure to the variance after the pedagogical experiment increased by 6,5%.

Conclusions / Discussion

It was established that during the study a redistribution of factors of special physical readiness among male partners and female partners of the studied group of acrobatic rock and roll athletes of the Juvenals category occurred, characterizing the variability of the load in the training process of the weekly microcycles of the pre-competitive mesocycle in the annual training macrocycles. The factor analysis allowed to establish the determining factors: speed-strength, coordination; anthropometric; functional preparedness. The results of the analysis of the factor structure of preparedness of athletes from acrobatic rock and roll testifies to the significant impact of the use of the developed speed-strength patterns, motor coordination and functional training (integral exercise complex) on the special and competitive readiness of athletes juvenals (male partners and female partners) at the stage preliminary basic training.

Conflict of interests. The authors declare that no conflict of interest.

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