

CORRELATION OF GENERAL AND SPECIAL PHYSICAL TRAINING OF ATHLETES CHEERLEADERS AT THE STAGE THE SPECIALIZED TRAINING BASE

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Annotation. Objective: to determine the most informative parameters of athletes in cheerleading. The experiment involved 14 athletes (age 16-18 years). To assess the physical fitness of the special developed 20 tests. The possibilities of creating favorable conditions for optimization of the training process and the achievement of high performance sports. Recommended special training to use the funds for the development of coordination abilities. In the general fitness should pay attention to the development and improvement of the spatial-temporal characteristics, the ability to navigate the space and to maintain equilibrium, co-ordination of movement, flexibility, power, speed and speed-strength abilities. Found that the success of the competitive activities of athletes depend on a rational balance of informative indicators.

Keywords: cheerleading, athletes, training, fitness, relationship, correlation.

Introduction

One of main tasks to be solved in training of cheerleaders is achievement of required level of motion abilities, which are under main load in this kind of sports [2, 5, 8]. Solution of this task is fulfilled in the frames of physical training, which ensures formation of general and special fitness and their manifestation in conditions of competitions. It is known that each of these and other sides of training is combined in complex, oriented on achievement of the highest results [9, 10]. The share of different elements in this complex, their interconnection and interaction are conditioned by laws of functional system's formation, which are pointed at final, specific for kind of sports effect of training and competition functioning [2, 10, 14, 19].

With analyzing of general and special fitness's indicators of sportsmen one should consider that division of physical fitness in general (GPF) and special (SPF) is rather relative. Actually such division characterizes something not divided, but only different to some extent sides of one and the same complex process, which are actually not only interconnected but are likely transferring to each other in dynamics [2, 8, 9].

It is undoubted that cheerleading forms its peculiar spectrum of correlations and interconnections of general and special fitness's indicators, registration of which at all stages of many year training can create favorable precondition for optimization of training process and achievement of high sport efficiency [1, 3, 5, 15-18, 20, 21]. That is why work in this field is rather urgent.

The research has been fulfilled as per to combined plan of scientific & research works in sphere of physical culture and sports for 2006-2011 in the frames of topic 2.2.4 "Improvement of control mechanisms of sportsmen's motion functioning", state registration No. 0106U011986).

Purpose, tasks of the work, material and methods

The purpose of the research is to experimentally determine the most informative indicators and to determine confident connections between indicators of general and special fitness of sportsmen-cheerleaders.

The object of the research is training process of sportsmen-cheerleaders and structure and content of the training is *the subject of the research*.

The main *task* of the research was determination of interconnection between indicators of general and special physical fitness of sportsmen-cheerleaders at the stage of specialized basic training.

For solution of the task we used a complex of scientific *methods of research*:

- 1) Pedagogic methods of research: (analysis and generalization of scientific-methodic literature data, pedagogic observation, pedagogic testing);
- 2) Methods of mathematical statistics.

Results of the research

In the research, which was carried out at the end of preparatory period, 14 sportswomen of 16-18 years old age – members of combined cheerleading team of NU "JAU, named after Yaroslav Mudriy, took part. When evaluating general physical fitness of sportswomen we oriented on traditional complex of tests for motion abilities [11]. Choice of tests for special fitness, which were studied in our experiment, was carried out on the base of analysis of dominating motion mode of competition exercise and specifics of cheerleading, as well as age requirements to the tested sportswomen and competition rules; besides, we considered the data of earlier conducted researches in kinds of sports with complex coordination (sport gymnastics and calisthenics, acrobatics, sports aerobics and so on). Considering all these, for evaluation of special physical fitness we worked out a set of control exercises [5, 7], which consisted of 20 tests.

For determination of the most informative indicators, as well as for registration of confident connections between indicators of general and special physical fitness we carried out correlation analysis.

Correlation field of cheerleaders' special physical fitness (n=14; p<0.05)

Number*	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	1	0.45	0.45	0.34	0.32	0.32	0.51	0.09	0.45	0.11	0.01	0.15	0.19	0.14	0.02	0.45	0.45	0.34	0.32	0.32
	1	1	0.67	0.53	0.73	0.81	0.66	0.19	0.02	0.27	0.26	0.04	0.14	0.03	0.18	0.67	0.53	0.73	0.81	0.66
		1	1	0.83	0.57	0.78	0.35	0.21	0.29	0.19	0.06	0.24	0.12	0.12	0.21	0.74	0.57	0.78	0.35	0.20
			1	1	0.71	0.65	0.48	0.21	0.16	0.07	0.31	0.14	0.21	0.02	0.41	0.71	0.65	0.48	0.21	0.16
				1	1	0.71	0.41	0.34	0.09	0.16	0.15	0.03	0.44	0.34	0.3	0.71	0.41	0.34	0.09	0.16
					1	1	0.38	0.28	0.04	0.13	0.25	0.16	0.16	0.05	0.01	0.38	0.28	0.04	0.13	0.25
						1	1	0.13	0.21	0.33	0.62	0.07	0.07	0.09	0.22	0.13	0.21	0.33	0.62	0.07
							1	1	0.22	0.12	0.02	0.01	0.81	0.86	0.96	0.22	0.12	0.02	0.01	0.89
								1	1	0.25	0.22	0.15	0.35	0.28	0.89	0.25	0.22	0.15	0.35	0.28
									1	1	0.64	0.71	0.01	0.11	0.57	0.64	0.71	0.01	0.11	0.42
										1	1	0.43	0.15	0.11	0.33	0.43	0.15	0.11	0.33	0.43
											1	1	0.12	0.05	0.21	0.12	0.05	0.21	0.12	0.05
												1	1	0.84	0.90	0.89	0.65	0.89	0.65	0.89
													1	1	0.16	0.07	0.16	0.13	0.33	0.12
														1	1	0.15	0.21	0.41	0.32	0.32
															1	1	0.21	0.22	0.81	0.66
																1	1	0.44	0.35	0.20
																	1	1	0.21	0.16
																		1	1	0.45
																			1	1

*Notes: tests for special physical fitness (SPF) – 1. Shuttle run with changing running techniques 4x9 (sec); 2. Throw of pompon, turn by 360° and catching of it (points).; 3. Keeping balance after turns (sec); 4. Two forward floor somersaults with turn by 360° (points); 5. Rhythmic cheer-dance movements (points); 6. Bridge (points); 7. Arms' rotations with gymnastic stick (points); 8. Split with right leg forward (points); 9. Split with left leg forward (points); 10. Cross split (points); 11. Keeping straight leg in positions: forward, aside, backward (sec); 12. Raising of straight legs in hanging on hands position (q-ty of times); 13. Jumping upward from deep squat during 20 sec. (q-ty of times); 14. Torso raising in sitting position from lying on back one during 20 sec. (q-ty of times); 15. Alternating legs' forward swings during 20 sec. (q-ty of times); 16. High jump from the spot (cm); 17. Run on the spot during 5 sec (q-ty of times); 18. Cheer-dance movements during 10 sec. (q-ty of times); 19. 10 forward bents from initial position: standing upright, hands – upward (q-ty of times); 20. IGS (%).

Table 2

Correlation field of cheerleaders' physical fitness (n=14; p<0.05)

Tests for general physical fitness										
100 m run (sec)	1									
500 m run (sec)	0.45	1								
Pressing ups in lying position (q-ty of times)	0.45	0.87	1							
Hanging on bent arms (sec)	0.34	0.53	0.74	1						
Forward torso bent from sitting position (cm)	0.32	0.29	0.29	0.82	1					
Long jump from the spot (cm)	0.32	0.86	0.78	0.29	0.16	1				
Shuttle run 4x9 m (sec.)	0.94	0.07	0.35	0.48	0.41	0.38	1			
Jump with turn (points)	0.09	0.19	0.29	0.21	0.34	0.28	0.51	1		
Keeping of balance (sec)	0.45	0.02	0.29	0.16	0.09	0.04	0.65	0.71	1	
Coordinated movements of arms, body, legs (points)	0.11	0.27	0.19	0.07	0.16	0.13	0.66	0.84	0.57	1

In table 1-2 we present correlation field of general and special physical fitness, where in 8 from 25 cases we found close connections. Results of the tests- splits ($r=0.96$, $r=0.89$, $r=0.57$); "shuttle run" 4x9 m ($r=0.94$); alternating leg swings forward for 20 seconds ($r=0.90$); cheer-dance movement for 10 sec. ($r=0.89$); pressing ups in lying position ($r=0.87$); long jump from the spot ($r=0.86$); combination of arms', body, legs' movements ($r=0.84$); taking sitting position from lying on the back one for 20 sec. ($r=0.84$); two forward floor somersaults, jump with turn by 360° ($r=0.83$); torso forward bent from sitting position ($r=0.82$); jumping upward from deep squat for 20 sec. ($r=0.81$) – are sufficiently objective criteria for selection and orientation of sportsmen in training system and competition functioning in cheerleading.

In the whole, results of the research proved that successfulness of cheerleaders' competition functioning depend on rational balance of the regarded informative indicators, which harmoniously interact in complex of trainings, effectively influence on complex structure of training.

It would be purposeful to consider the data, obtained in the conducted research, with organization and planning of training process for sportsmen-cheerleaders at the stage of specialized basic training.

In table 3 we present correlation matrix of interaction of general physical and special fitness's indicators of sportsmen-cheerleaders.

Correlation analysis resulted [6, 12] in determination of high and middle interconnections between general and special fitness in 23 cases. It can be explained by the fact that these kinds of training are interconnected and with their optimal distribution in training process they effectively influence on efficiency of cheerleaders' competition functioning. For example, high and statistically confident correlation coefficients' values (from 0.80 to 0.94) have been registered in six cases that points at high degree of interconnection between the studied indicators. In particular it relates to the following correlations:

- Long jump from the spot – high jump from the spot ($r = 0.94$);
- Long jump from the spot - jumping upward from deep squat during 20 sec. ($r = 0.91$);
- Coordinated movements of arms, body, legs - two forward floor somersaults with turn by 360° ($r = 0.91$);
- Coordinated movements of arms, body, legs - rhythmic cheer-dance movements ($r = 0.84$);
- Forward torso bent from sitting position - arms' rotations with gymnastic stick ($r = 0.83$);
- Shuttle run 4x9 m - shuttle run with changing running techniques 4x9 m ($r = 0.82$).

In five cases correlation coefficients turned out to be also statistically confident, in spite of their being lower by their absolute values, videlicet:

- "Flamingo" – keeping balance after turns ($r = 0.79$);
- Forward torso bent from sitting position- cross split ($r = 0.78$);
- Jump with turn - torso raising in sitting position from lying on back one during 20 sec. ($r = 0.76$);
- Long jump from the spot - alternating legs' forward swings during 20 sec. ($r = 0.74$)
- 100 m run – run on the spot during 5 sec. ($r = 0.70$).

Correlation matrix of interconnection of general physical and special fitness's indicators of cheerleaders (n=14; p<0,05)

		Tests for GPF									
Tests for SPF	Tests for general physical and special physical fitness	100 m run (sec)	500m run (sec)	Pressing ups in lying position (q-ty of times)	Hanging on bent arms (sec)	Forward torso bent from sitting position (q-ty of times)	Long jump from the spot (cm)	Shuttle run 4x9 m (sec)	Jump with tun (points)	"Flamingo" (sec)	Coordinated movements of arms, body, legs (q-ty of times)
		Shuttle run with changing running techniques 4x9 (sec)	0.49	0.35	0.14	0.32	0.08	0.43	0.82	0.51	0.13
	Throw of pompon, turn by 360° and catching of it (points).	0.01	0.21	0.03	0.22	0.33	0.31	0.06	0.73	0.04	0.11
	Throw of pompon, turn by 360° and catching of it (points).	0.35	0.05	0.21	0.24	0.08	0.07	0.37	0.12	0.79	0.48
	Throw of pompon, turn by 360° and catching of it (points)	0.22	0.42	0.01	0.49	0.36	0.41	0.45	0.38	0.36	0.91
	Rhythmic cheer-dance movements (points)	0.07	0.47	0.07	0.26	0.21	0.05	0.28	0.14	0.01	0.84
	Bridge (points)	0.21	0.22	0.35	0.32	0.62	0.22	0.49	0.24	0.03	0.24
	Arms' rotations with gymnastic stick (points)	0.55	0.01	0.15	0.46	0.83	0.19	0.14	0.32	0.11	0.48
	Split with right leg forward (points)	0.50	0.24	0.01	0.02	0.76	0.21	0.21	0.11	0.02	0.16
	Split with left leg forward (points)	0.04	0.32	0.34	0.07	0.65	0.54	0.01	0.08	0.46	0.45
	Cross split (points)	0.31	0.44	0.22	0.42	0.78	0.98	0.24	0.36	0.31	0.12
	Keeping straight leg in positions: forward, aside, backward (sec)	0.48	0.02	0.67	0.05	0.23	0.32	0.32	0.02	0.07	0.47
	Jumping upward from deep squat during 20 sec	0.05	0.13	0.69	0.48	0.26	0.43	0.49	0.32	0.37	0.15
	Jumping upward from deep squat during 20 sec (q-ty of times)	0.41	0.55	0.01	0.05	0.11	0.91	0.52	0.22	0.25	0.29
	Torso raising in sitting position from lying on back one during 20 sec. (q-ty of times)	0.47	0.01	0.24	0.09	0.35	0.82	0.07	0.76	0.59	0.26
	Alternating legs' forward swings during 20 sec. (q-ty of times)	0.72	0.31	0.04	0.58	0.29	0.74	0.21	0.21	0.16	0.48
	High jump from the spot (cm)	0.44	0.24	0.19	0.59	0.05	0.94	0.55	0.54	0.12	0.17
	Run on the spot during 5 sec (q-ty of times);	0.70	0.21	0.39	0.24	0.19	0.2	0.09	0.27	0.46	0.32
	Cheer-dance movements during 10 sec. (q-ty of times)	0.62	0.14	0.42	0.49	0.02	0.5	0.22	0.24	0.34	0.45
	10 forward bents from initial position: standing upright, hands – upward (q-ty of times);	0.62	0.34	0.49	0.24	0.42	0.74	0.59	0.17	0.02	0.48
	IGS(%)	0.51	0.68	0.02	0.32	0.49	0.21	0.21	0.36	0.56	0.41

It has been proved that means of special training help sportsmen to acquire skills of cheerleading movements, which are characterized by complex coordination, develop balance, skills in rotational movements, improve strength, quickness and speed-power ability as well as flexibility.

Execution of quick and complex coordinated movements by arms, torso, legs and head, rhythmically, easily and under music is impossible without good coordination, preciseness of movements and ability to keep balance. In this connection, at the stage of specialized basic training of cheerleaders means for development of coordination abilities play important part in special training.

In general physical training it is recommended to pay attention to development and perfection of space-time characteristics; coordination of movements, flexibility, strength, quickness and speed power abilities, because these qualities are connected with special training of cheerleaders and are manifested not in isolated way but in complex interaction.

Conclusions:

1. It has been experimentally proved and mathematically verified that the most informative indicators of general and special physical fitness of sportsmen-cheerleaders are results of the following tests: splits ($r=0.96$, $r=0.89$, $r=0.57$); "shuttle run" 4x9 m ($r=0.94$); alternating forward legs' swings during 20 sec. ($r=0.90$); cheer-dance movements during 10 sec. ($r=0.89$); pressing ups in lying position ($r=0.87$); long jump from the spot ($r=0.86$); coordinated movements of arms, torso, legs ($r=0.84$); raising of torso in sitting position from lying on the back one during 20 sec. ($r=0.84$); two forward floor somersaults, jump with turn by 360° ($r=0.83$); torso's forward bent from sitting position ($r=0.82$); jumping up[ward from deep squat during 20 sec. ($r=0.81$) which render main load in competition exercises. The listed tests are objective criteria of selection and orientation of sportsmen in system of cheerleading training and competition functioning.

2. At the stage of specialized basic training for fulfillment of modern complex element cheerleader shall have good physical fitness and have highly developed such motion qualities as coordination abilities, flexibility, speed-power abilities, strength and quickness. Besides, in order to endure significant training and competition loads he shall have high level of special endurance.

The prospects of further researches are: working out of complexes for development of most informative qualities of sportsmen-cheerleaders.

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