

**SPECIFIKACIJA STRUKTURE MOTORIČKIH SPOSOBNOSTI MLADIH  
KOŠARKAŠA U BUGARSKOJ**  
**SPECIFICATION OF THE MOTOR POTENTIAL STRUCTURE OF YOUNG  
BASKETBALL PLAYERS IN BULGARIA**

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**Abstract:** An investigation of the motor potential of young basketball players, made by variation analysis during 20 years period – in 1986, 1996 and 2006 is presented in this report.

The researched 55 basketball players are from the Sport school in Veliko Trnovo and from the basketball club “Etar” and are from 12 to 18 years old. A research of the anthropometric and speed-power indicators, also indicators for general and special endurance and laboratory functional indicators is provided.

**Keywords:** basketball, young basketball players, motor potential.

**Sažetak:** Ovaj rad predstavlja istraživanje motoričkih sposobnosti mladih košarkaša, rađeno različitim analizama tokom perioda od 20 godina- 1986, 1996 i 2006. godine.

U istraživanju je učestvovalo 55 košarkaša iz Škole sporta u Velikom Trnovu iz Košarkaškog kluba “Etar”, koji su 12-18 godina starosti. Istraživanjem su dobijeni antropometrijski i brzinsko-snažni indikatori, kao i indikatori opšte i specijalne izdržljivosti i funkcionalni laboratorijski indikatori.

**Ključne riječi:** košarka, mladi košarkaši, motorička sposobnost.

## Introduction

In the modern world the basketball game is very popular. It is indicative that millions young people, and mostly teenagers, are playing the game with the orange ball systematically, and not only in the sports halls in a regular training process but also in the school yards, in the free street spaces and even in beaches, as they play street basket and beach basket. This is a very good way for the young people to do motor and sports intellectual activities, as opposed to the unhealthy habits, which are inherent to the modern society. Alongside with this, the living conditions, including the sports possibilities in Bulgaria, have changed since 1990. The good for the past organizational practices in sports today have changed to a great degree and this has led to new approaches for the realization of good sports preparation in the modern social-economic conditions of life and the rest of the people.

**Methodology.** For data processing from the investigation have been used variation analysis and t-criteria of Student for the comparison of homogeneous quantities.

**Expose.** The Longitudinal and transversal investigations of the motor training of the young basketball players and people that don't do sports activities of the same age are provided in 1986, 1996 and 2006. The generalized results show that in 12-year-old students from both groups (doing and not doing sports activities), there is a tendency in the development of the quality of power.

There is a decrease in the level of the power for both groups investigated, with the exception of the hand-held dynamometry in people that don't do sports activities, where there is an improvement of the results, but these results are lower than the results of the active sports people.

The comparison of the results in the group of basketball players shows that in 2006 the achievements in the 6 tests are lower than these in 1986 (table 1):

*Investigation of the power of young basketball players***TABLE 1.** RESULTS FROM THE INVESTIGATION OF THE POWER OF BASKETBALL PLAYERS AND 12-YEAR-OLD BOYS, NOT DOING SPORTS ACTIVITIES

№	Тест	Metric system	Year	X 1 Basketball players	X 2 Not doing sports activities	d1 Basketball players	d 2 Not doing sports activities
1	Dynamometry strong hand	kg	1986	26.86	9.47	-0.76	+0.33
			1996	26.10	9.80		
			2006	25.50	10.30		
2	Dynamometry weak hand	kg	1986	24.89	7.33	- 0.80	+ 0.55
			1996	24.09	7.88		
			2006	23.10	8.10		
3	Loom power	kg	1986	75.50	64.20	-2.04	-0.40
			1996	73.46	60.20		
			2006	70.20	53.10		
4	Long jump	cm	1986	192.70	181.50	-1.10	-20
			1996	191.60	161.50		
			2006	190.30	145.51		
5	Height of rebound	cm	1986	42.50	33.07	-1.65	+0.33
			1996	40.50	34.40		
			2006	40.40	34.90		
6	Throwing of medicine ball 2 kg	cm	1986	580.00	445.00	-12	+7
			1996	568.00	452.00		
			2006	545.00	458.00		

It is obvious that the differences in the values of the power of the strong and weak hand and also these of the long jump are sizeable (Pt =95%). The decrease in the results of the third test – loom power, is also considerable – by 5.26 kg (Pt =95 %).

The fourth test *Two-footed standing long jump* is usually used to measure the strength of the lower limbs from a speed-power aspect. In this case the basketball players experience a decrease in their achievement within the same period, despite the insignificant difference. This test also indicates the decrease in strength of the lower limbs in sports people. As for the those not doing any sport, the tendency towards a decrease in achievements is also evident, what is more, the differences are considerable (P%>95).

The *Height of Rebound* test also testifies for the speed-power qualities of the people investigated (table 1). What this test also indicates is an insignificant decrease in the results of basketball players, and a minimal increase in the ones not doing any sport. The differences between the two groups are significant and in favour of the sports people.

The *2-kg-Ball-throwing test with both hands above the head* is a test, which measures the body strength and that of the upper limbs. There is a similar tendency of decrease in achievements in basketball players, even though there is only insignificant difference and minimal improvement in the achievements of those not practicing any sport. In the case with the latter, however, the values are a lot lower than those of the basketball players.

Having analysed the strength as a motor quality, there is a noticeable tendency of decrease in the strength among the growing up basketball players in the time interval investigated.

The achievements of girls playing basketball are far better than the ones who do not practise sports, which is natural, having in mind the great effect basketball has on those who practise it regularly.

The descending line of development of the measured motor quality and the especially significant decrease of the strength of the lower limbs and loom power among *those not practising any sport* prove that the school children's immobilisation continues and it influences the development of the quality power in a negative way.

### *Investigation of the stamina of young basketball players*

The results of the stamina investigation show that among 12-year-old girls of both groups (playing sports and not playing any sport) there *exists an analogous tendency* in the dynamics of the results from the applied stamina tests in basketball, serving as a condition for successful practise of this sport (table 2).

**TABLE 2.** THE RESULTS OF THE STAMINA INVESTIGATION AMONG BASKETBALL PLAYERS AND THE NOT PLAYING ANY SPORT 12-YEAR-OLD GIRLS

№	Test	Metric system	Year	X 1 Basketball players	X 2 Not doing sports activities	d1 Basketball players	d 2 Not doing sports acti- vities
1	Shuttle running 10 x 5,8 m	cm	1986	16.70	17.10	0.23	0.71
			1996	16.93	17.81		
			2006	17.20	18.42		
2	Running 1000 m	kg	1986	191.94	240.1	30.06	4.5
			1996	221.10	244.6		
			2006	224.40	251.4		

What is typically noticeable is a decrease in the stamina level for both groups investigated, irrespective of the average values measured.

The comparison of the results with the basketball group shows that the measurements taken in 2006 are weaker in both tests.

The proven differences are not of static importance according to the measurements of t-criteria of Student for independent extracts ( $Pt < 95\%$ ) taken at the shuttle running test. There is a noticeable tendency towards a decrease in the stamina level within the time interval investigated. The reasons, according to us, are complex and confirm the above-mentioned ones in relation to strength. The achievements among *those not doing any sport* for the period of 12 years are also going down, which shows that the level of the physical fitness investigated decreases.

*The descending line* of development of the measured motor quality is clearly outlined. This is more strongly noticeable in test №2 – Running 1000 m. The differences (d) between the average values are of static importance, with a characteristic difference between 1986 and 1996 among basketball players in the running test of 1000 m, by 30.06 s.

*Investigation of the speed of young basketball players (table 3).***TABLE 3.** RESULTS FROM INVESTIGATION OF SPEED AMONG BASKETBALL PLAYERS AND NOT THOSE PRACTISING ANY SPORT 12-YEAR-OLD GIRLS

№	Test	Metric system	Year	X 1 Basketball players	X 2 Not practising any sport	d1 Basketball players	d 2 Not practising any sport
1	Running 20 m	s	1986	3.75	4.00	+ 0.13	+ 0.12
			1996	3.88	4.12		
			2006	3.92	4.22	+ 0.04	+0.10

The achievements of the basketball players are not any better in 2006 than those in 1986 and 1996. The increase of the run time taken at the 20 m running is by 0.13 s for the first 10-year period, and for the next – by 0.04 s. As the differences are not significant (the values of t-criteria of Student are  $P_t < 95\%$ ), overall conclusions cannot be made, yet it is a fact that the speed of basketball players is worsening. According to us, this is due to the bad sports conditions existing at the moment – lack of two-staged training, appropriate food or equipment, as it was before the closing down of the Sports schools around the country.

The achievements of those not practising any sports are also worsening, and in comparison with the basketball players these achievement are practically discouraging, which is a sign that the continuous immovability of the children bears its negative results.

In table 4 are represented the results of the investigation of the motor training of 18-year-old basketball players and those not practising any sport of the same age.

**TABLE 4.** RESULTS FROM THE INVESTIGATION OF MOTOR TRAINING AMONG BASKETBALL PLAYERS AND THOSE NOT PRACTISING ANY SPORT 18-YEAR-OLD GIRLS

№	Test	Metric system	Year	X 1 Basketball players	X 2 Not practising any sport	d1 Basketball players	d 2 Not practising any sport
1	Height	cm	1986	190.00	174.70	0.3	0.5
			1996	190.30	175.20		
			2006	192.10	177.10	1.8	1.9
2	Weight	kg	1986	76.23	76.20	1.07	1.9
			1996	77.30	78.30		
			2006	78.50	80.80	2.27	4.6
3	Flexibility	kg	1986	16.48	15.80	-0.98	-1.4
			1996	15.50	14.40		
			2006	16.27	13.60	-0.77	-0.8
4	Dynamometry strong hand	kg	1986	65.97	42.00	-2.67	-1.7
			1996	63.30	40.30		
			2006	64.10	39.80	0.8	-0.5
5	Dynamometry weak hand	kg	1986	61.86	39.93	-1.76	-1.73
			1996	60.10	38.20		
			2006	61.20	37.70	1.1	-0.5

6	Loom force	kg	1986	203.37	152.10	-4.57	-1.6
			1996	198.80	150.50		
			2006	199.20	148.80	0.4	-1.7
7	Throwing of medicine ball 2 kg	kg	1986	12.92	8.86	-1.62	-0.66
			1996	11.30	8.20		
			2006	12.30	8.50		
8	Standing long jump	cm	1986	267.74	221.60	-3.64	-1.1
			1996	264.10	220.50		
			2006	265.40	218.10		
9	Height of rebound	cm	1986	68.23	50.06	-1.03	-1.06
			1996	67.20	49.00		
			2006	67.50	48.30		
10	Running 1000 m	s	1986	191.94	227.47	4.64	2.83
			1996	195.30	230.30		
			2006	196.60	232.20		
11	Shuttle running 10 x 5,80 m	s	1986	12.92	15.50	1.28	0.50
			1996	14.20	16.00		
			2006	13.10	16.20		
12	Running 20 m	s	1986	2.65	3.01	0.15	1.90
			1996	2.80	3.20		
			2006	2.70	3.33		

### *Variation analysis of motor training of 18-year-old basketball players and those not practising any sport*

The data of the variation analysis from the 20-year-long investigations based on the physical development and motor training among 18-year-old basketball players and those not practising any sport of the same age are represented in table 4.

There is a noticeable increase in the height of basketball players by 2.1 cm and in those not doing any sport - by 2.4 cm, a result from the acceleration of the children in Bulgaria. This increase is a lot less in basketball players, due to the preliminary choice and selection of taller children, as early as 10-12 years of age.

There is also an indicated increase in weight by 2.27 kg in basketball players and by 4.6 kg in those not doing any sport. A tendency towards weight increase in those not doing any sport is also noticeable, which leads to unfavourable tendencies characteristic of the present generation.

The flexibility is declining too, which then is added to the negative tendencies of present day life.

The power indicators – dynamometry of strong and weak hand, loom power and throwing of medicine ball with both hands above the head show a descending gradation in the number of basketball players investigated, as well as in those not practising any sport. There is a decrease in the dynamometry of strong and weak hand by 1.87 kg, and in the weak hand – an increase by 1.1 kg is noticed. With those not doing any sport it increases by 2.2 kg for the strong hand and by 0.66 kg for the weak. With the loom power test the strength is worsening by 4.17 kg in basketball players and by 3.3 kg in those not doing any sport. Apparently, the continuous immovability of the young generation influences not only the sports people, but also those not practising any sport.

At the Throwing of medicine ball of 2 kg test there is a confirmed tendency towards a decrease in the explosive force of the torso, yet to a smaller extent.

With the tests showing the speed-power potential of the lower limbs, there is a characteristic decrease in both groups investigated – the basketball players and those not doing any sport within the 20-year-long period in question. The 18-year-old youngsters in Bulgaria have reduced their motor potential, similarly to the 12-year-olds, which does not generate a successful future to this investigated group in question in our country.

As far as the durability of the basketball players and those not practising any sport 18-year-olds is concerned, the worsening of the results is evident and quite typical for the same motor quality. In basketball players, the decrease in the results is by 4.4 s, and in those not practising any sport – 4.73 s.

Even though there is only a minimal decline in the speed factor, it adds up to the overall impression concerning the present day young generation – i.e. worsening of the motor potential of 12 to 18 year old children. The basketball players also weaken their indicators, but their results are far better, proving the favourable influence basketball has on the physical well-being of the growing up generation.

**Conclusion.** It has to be pointed out that, despite the contemporary tendencies of increase in basketball dynamics worldwide, the athletic qualities (speed, strength, speed-power abilities and stamina, in particular) of the present day young generation are going down in their measurement scale. Those children not practising any sport are gradually worsening their motor potential and this is yet another signal to parents and sports coaches to put the children into regular sports activities. The reasons for the worsening of the motor potential and physical abilities of 12-year-olds, according to us, are related to:

Periods of negative influence driven by the existing educational system as a whole, and physical education and sports in particular;

Unwise manipulation and reckless use of contemporary inventions such as cable TV, computers and internet, and the addiction to all of them at the expense of doing sports activities or having free time.

With basketball players the reasons are of complex nature, taking into consideration the fact that the greater part are related to the organisation and material supply of the training process for students, following the example of the former sports schools in the country (including the one in Veliko Tarnovo). More specifically, these reasons can be narrowed down to the following:

- no two-staged training sessions;
- lack of specialised camp training;
- no specialised power training, as the short time of the sessions is used for technical-tactics training;
- no supplementary nutritious diet provided;
- no recuperating programmes carried out;
- problems with the outfit and equipment with basketball players are still evident;
- at this young age the girls do not attend fitness clubs, especially typical of adolescents above 15-16 years of age.

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