

## ROLE OF FORCE TRAINING IN PHYSICAL TRAINING OF STUDENT BASKETBALL TEAM PLAYERS

Brynzak S.S., Krasnov V.P.

National University of Life and Environmental Sciences of Ukraine

**Annotation.** Presented results of the implementation of the program of strength training in the preparation of the annual cycle of student basketball team. The study involved 15 athletes. The testing program included the evaluation of home and remote speed (running 6 and 20 m with a high launch), speed and overall endurance (2x40 shuttle run test with and Cooper), speed-strength (high jump), strength (gets dynamometry). Strength training program was included in classes 3 times a week for two months before the start of the competition period. Found that the proposed program of strength training improves physical fitness of the players. Marked increase in the level of development of motor qualities of the players during the macrocycle. There was a significant increase in physical fitness of players on the team at the end of the competition period. Marked improvement in starting, telecommuting, speed and speed endurance. Increased overall endurance and strength, but the level of development is low.

**Keywords:** basketball, college students, strength training, physical training, tests, macrocycle.

### Introduction

Boys, who play in universities' teams, are the prospect of national basketball of the country; that is why the problem of their training shall be paid great attention to.

However, owing to different reasons, arsenal of methodic and scientific researches devoted to increasing of training process's quality and competition activity's effectiveness of most students' teams is insufficient, while "amateur" frames, in which most of such teams have to survive, do not cause proper specialists' interest to development of recommendations for players and coaches for increasing of their activity's effectiveness.

One of the problems, which is faced by most of students' basketball teams, is deficit of players' power training. [7, 8, 9, 11, 12]. Importance of such kind of university team's training is conditioned by high competition requirements, without which modern students' basketball is impossible.

Importance of basketball players' power training on modern stage of this kind of sports' development is discussed in the works of domestic and foreign specialists [2, 4, 5]. To play modern basketball on high level, it is insufficient just to have talent. It is necessary to have physically developed body of athlete. For example, by the data of American specialists [2], basketball players of national students association and NBA pay to general physical training up to 70% of load. NVF basketball players spend every morning's training, which is of 4 hours duration, in SIM hall. We can surely say: no club in the world, except NBA, pays so much attention to GPT (general physical training). GPT means endurance, easiness of movements, spring ability and so on.

Thus, the problem of power training of student team's players is an urgent one and requires experimental solution.

### Purpose, tasks of the work, material and methods

*The purpose of the research* is to experimentally prove effectiveness of power training program for improvement of physical conditions of student basketball team's players.

*The methods and organization of the research:* the methods were: studying, analysis and generalization of literature sources and documents, devoted to the problem of our research, pedagogic observation, testing of physical conditions.

In research 15 players of students' combined basketball team of National university of biological resources and utilization of nature of Ukraine took part; this team plays in championship of Kiev among HEEs of 1-4 level of accreditation and in Christian basketball league of male teams. Five players were of first grade, 7 – of the second and 3 – without grade. In first ten-day period of September (beginning of experiment) we carried out testing of players physical conditions. Then, we introduced the program of power exercises in team's training process in preparatory period; this program was fulfilled by players 3 times every week, during two months (September, October) up to beginning of competition period together with trainings in game hall (3 times a week). After this we fulfilled intermediate testing of players physical conditions.

In competition period, since November up to March, players continued to train in SIM hall, but only twice a week. With it, games were planned for days-off and trainings in game halls were conducted 3 times a week. After finishing of scheduled championship, before "play-off" games we carried out final testing of players' physical conditions.

The program of power training is presented in schema 1.

Nos	Methods
1	Repeated method (development of main arms' and legs' power). Work at every station – 15 seconds, no rest intervals between stations. Between strokes, during rest, - stretching exercises are to be fulfilled. <b>Exercises on stations:</b>
	Push of weight from breast
	Squatting with weight

	Squatting with weight Jerk of weight	Pressing of weight in standing position Squatting with weight
2	Interval method (development of explosive power). Work at stations 20 seconds. Rest between stations – 15 seconds. Rest between series 4 minutes – stretching exercises. <b>Exercises at stations:</b>	
	Push of weight from breast Squatting with weight Pressing ups	Squatting with weight Pressing of weight in standing position Squatting with weight
3	Continuous method (development of endurance). Work at every station – 15 seconds. No rest between stations. Rest between strokes – 1-2 minutes (stretching exercises during rest). <b>Exercises at stations:</b>	
	Weight pressing in lying position Squatting with weight Raising of torso in lying position Pressing ups from bench Raising on pedestal with dumbbells	Hyperextension of back Chin-ups Jumping with weight from squatting position Torso turns with heavy ball

*Schemal. Program of players' power training*

To make work with sportsmen easier we composed table 1, in which we presented all three methods as well as explanations to them.

Table 1

*Methodic recommendations for application of power training's methods*

Purpose of training	Method of training	Quantity of strokes	Rest intervals between strokes	Rate of exercise's fulfillment	Quantity of exercise's repetitions	Working load
Development of main strength	Repeated method (weight-lifters' method)	3-5	5 minutes	Continuous (smooth)	6-8	75-100 %
Development of explosive power	Interval method, with breaks	3-6	2-5 minutes	Explosive	6-10	40-70 %
Development of endurance	Continuous method	3-5	1-2 minutes	Continuous (smooth)	15-30	20-50 %

**Results of the researches**

For solution of the set tasks we carried out initial testing of physical conditions at the beginning of season.

Testing program stipulated appraisal of start and distance speed (6 and 20 meter' run from high start), speed and general endurance (shuttle run 2x40 sec and Cooper's test), speed-power abilities (high jump), strength (backbone dynamometry).

Average indicators of players' physical conditions are given in table 2.

Table 2

*Average indicators of student basketball team players' physical conditions at the beginning of training period*

Nos	Test exercises	Evaluated ability	Indicator	
			$\bar{x}$	S
1	6 m run, sec.	Start speed	1.71	0.11
2	20 m run, sec.	Distance speed	3.42	0.13
3	Shuttle run, 2x40 sec. meters	Speed endurance	372	0.17
4	High jump, cm	Speed-power abilities	61	0.82
5	12minutes run, Cooper's test	General endurance	2682	53
6	Backbone dynamometry, kg	Strength	143	3

With evaluation of physical conditions in basketball it is accepted to consider that 7 points and higher witness about high player's physical condition. 4 points and lower mean low physical conditions as per 10 points scale (see table 3).

Table 3

*Scale of evaluation of basketball players' testing, points (as per R.A. Korneyev) [5])*

Points	Tests					
	6 m run, sec.	20 m run, sec.	Shuttle run, 2x40 sec. meters	12minutes run,	High jump, cm	Backbone dynamometry, kg
10	1.01	2.76	431	3253	66.5	169
9	1.10	2.35	423	3242	65	167

8	1.19	2.94	415	3211	63.5	165
7	1.27	3.03	407	3180	62	163
6	1.35	3.13	393	3149	61.5	161
5	1.43	3.22	385	3098	60	159
4	1.52	3.32	380	3057	59.5	157
3	1.60	3.42	369	3026	56	155
2	1.69	3.52	361	2885	54.5	153
1	1.73	3.62	353	2765	53	151
0	1.87	4.53	345	2654	51.5	149

Analysis of the obtained results of testing of mail students' basketball team showed that start, distance speed, speed and general endurance, strength are on low level, while speed-power abilities are on middle level.

Then we introduced in training process of basketball players the above described program of power training, which was realized during one and half months.

At the end of preparatory period we carried out intermediate testing of players' physical conditions. The obtained indicators of players' physical conditions are given in table 4.

Table 4

*Mean indicators of physical conditions of student basketball team's players at the end of preparatory period.*

Nos.	Test exercises	Evaluated ability	Indicator	
			$\bar{x}$	S
1	6 m run, sec.	Start speed	1,49	0,08
2	20 m run, sec.	Distance speed	3,15	0,10
3	Shuttle run, 2x40 sec. meters	Speed endurance	395	0,22
4	High jump, cm	Speed-power abilities	64	0,82
5	12minutes run, Cooper's test	General endurance	2940	61
6	Backbone dynamometry, kg	Strength	154	0,32

Analysis of the obtained results of intermediate testing of mail students' basketball team showed that start, distance speed, speed and general endurance, strength improved, accordingly from 1.71 sec. to 1.49 sec., from 3.42 sec. to 3.15 sec. and from 372 m to 395 m, and are on middle level of development. With it, general endurance and strength also increased, accordingly, from 2682 m to 2940 m, but level of development was still low. Speed-power abilities also increased from 61 cm to 64cm that shows high level of quality's development.

Results of intermediate testing permit to conclude that program of power training positively influenced on players' physical conditions during preparatory period, without leaving for training session.

In competition period the tasks of training process change. Attention is accentuated on technical-tactic preparation, special place is taken by psychological training; importance of physical training reduces and is shifted to maintaining of team players' functional level.

In this connection trainings in SIM hall by introduced program were reduced to 2 times a week and, together with special basketball exercises, permitted to maintain proper level of players' physical condition.

After scheduled championship, before "play off" series, we conducted final testing of players that permitted to determine influence of 2 single power trainings and special basketball exercises on their physical conditions in competition period, (see table 5).

Таблица 5

*Mean indicators of physical conditions of student basketball team's players at the end of competition period.*

Nos.	Test exercises	Evaluated ability	Indicator	
			$\bar{x}$	S
1	6 m run, sec.	Start speed	1,24	0,04
2	20 m run, sec.	Distance speed	3,01	0,07
3	Shuttle run, 2x40 sec. meters	Speed endurance	400	0,36
4	High jump, cm	Speed-power abilities	66	0,53
5	12minutes run, Cooper's test	General endurance	2994	57
6	Backbone dynamometry, kg	Strength	165	0,34

Analysis of the obtained results of intermediate testing of mail students' basketball team showed that start, distance speed, improved, accordingly from 1.49 sec. to 1.24 sec. and from 3.15 sec. to 3.01 sec. that witness about high level. Speed endurance improved insignificantly from 395 m to 400 m, and was on middle level. Alongside with it, general endurance increased from 2940 m to 2994 m, but the level of development is still considered low. Strength increased from 154 kg to 165 kg, while speed-power abilities increased insignificantly – from 64 cm to 66 cm.

Thus, the applied program of power trainings and analysis of the obtained testing results of players in annual cycle, permit to show dynamics of physical condition's indicators of student team's basketball players (see table 6).

Table 6

*Dynamics of physical condition's indicators of student team's basketball players*

Nos.	Evaluated ability	First testing		Second testing		Third testing		p
		$\bar{x}$	S	$\bar{x}$	S	$\bar{x}$	S	
1	Start speed	1.71	0.11	1.49	0.08	1.24	0.04	< 0.05
2	Distance speed	<b>3.42</b>	0.13	3.15	0.10	3.01	0.07	< 0.05
3	Speed endurance	372	0.17	395	0.22	400	0.36	< 0.05
4	Speed-power abilities	61	0.82	64	0.82	66	0.53	< 0.05
5	General endurance	2682	53	2940	61	2994	57	> 0.05
6	Strength	143	3	154	0.32	165	0.34	< 0.05

Coming from the obtained dynamics of physical conditions of the tested players we can affirm that the level of their evaluated skills substantially increased ( $p < 0.05$ ).

The tested mail students' basketball team became a finalist of Kiev championship among HEEs of 3-4 accreditation level and the Champion of open Christian basketball league among mail teams in Kiev.

**Conclusions**

Analysis of the obtained data permits to conclude:

- Power training program, introduced in annual cycle of mail student basketball team's trainings, facilitates improvement of players' physical conditions;
- From initial stage of macro-cycle to finalizing one, level of development of players' motion abilities raised from low and lower than middle to high and middle;
- Significant improvement of players' physical conditions was registered at the end of competition period.

*The prospects of further researches* in conditions of non-profiled HEE assume study of specificity of different game role players' game activity and, on this base, development of power training program, which would consider all peculiarities of physical conditions of fullbacks, forwards and center-line players.

**References:**

1. Gomel'skij A. Ia. *Enciklopediia basketbola ot Gomel'skogo* [Encyclopedia of basketball from Gomel'skij], Moscow, Grand-Fair, 2003, 352 p.
2. Gomel'skij V. *NBA* [NBA], Moscow, Gorodets, 2007, 224 p.
3. Elevich S. N. *Dinamika special'noj podgotovki basketbolistov vysokoj kvalifikacii v sorevnovatel'nom periode godichnogo cikla* [Dynamics of special training of highly qualified basketball players in the competitive period of the annual cycle], Cand. Diss., Moscow, 2004, 27 p.
4. Kozina Zh.L. *Pedagogika, psihologiya ta mediko-biologichni problemi fizichnogo viovanna i sportu* [[Pedagogics, psychology, medical-biological problems of physical training and sports](#)], 2007, vol.2, pp. 47-53.
5. Korneev R.A. *Teoriia i praktika fizicheskoy kul'tury* [Theory and practice of physical culture], 2004, vol.3, pp. 51-54.
6. Matveev L.P. *Obshchaia teoriia sporta i ee prikladnye aspekty* [The general theory of sport and its applications], Moscow, News, 2001, 333 p.
7. Platonov V.N. *Sistema podgotovki sportsmenov v olimpijskom sporte* [The system of preparation of sportsmen in Olympic sport], Kiev, Olympic Literature, 2004, 808 p.
8. Poplavskij L. Iu. *Basketbol* [Basketball], Kiev, Olympic Literature, 2004, 447 p.
9. Sokolov A. M. *Podgotovka basketbolistov massovykh razriadov v nefizkul'turnykh vuzakh s uchetom osobennostej fizicheskogo razvitiia studentov* [Training of basketball players in non-athletic universities allowing peculiarities of students' physical development], Cand. Diss., Moscow, 2003, 137 p.
10. Furaeva N. V. *Struktura podgotovki basketbol'nykh komand v godichnom sorevnovatel'no-trenirovochnom cikle* [Structure of basketball teams training in the annual competitive training cycle], Cand. Diss., Moscow, 2001, 158 p.
11. Cherrington J., Watson B. Shooting a diary, not just a hoop: using video diaries to explore the embodied everyday contexts of a university basketball team. *Qualitative Research in Sport and Exercise*. 2010, vol.2(2), pp. 267-281. doi:[10.1080/19398441.2010.488036](https://doi.org/10.1080/19398441.2010.488036).
12. Oudejans R.R.D., Heubers S., Ruitenbeek J.-R.J.A.C., Janssen T.W.J. Training Visual Control in Wheelchair Basketball Shooting. *Research Quarterly for Exercise and Sport*. 2012, vol.83(3), pp. 464-469. doi:[10.1080/02701367.2012.10599881](https://doi.org/10.1080/02701367.2012.10599881).

#### Information about the authors

**Brinzak S.S.:** sava082@ukr.net; National University of Life and Environmental Sciences of Ukraine; Heroes of Defense str., 15, Kyiv, 03041, Ukraine

**Krasnov V.P.:** sava082@ukr.net; National University of Life and Environmental Sciences of Ukraine; Heroes of Defense str., 15, Kyiv, 03041, Ukraine

---

**Cite this article as:** Brynzak S.S., Krasnov V.P. Role of force training in physical training of student basketball team players. *Physical education of students*, 2013, vol.5, pp. 13-17. doi:10.6084/m9.figshare.770990

The electronic version of this article is the complete one and can be found online at: <http://www.sportpedagogy.org.ua/html/arhive-e.html>

This is an Open Access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited (<http://creativecommons.org/licenses/by/3.0/deed.en>).

---

Received: 25.06.2013  
Published: 10.09.2013