Technology of concentrated training as one of ways to optimization students' basketball trainings

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Abstract

Purpose: to find out effectiveness of concentrated training technology in students' basketball trainings.

Material: 55 students participated in experiment. The research was being conducted during one academic year. Skillfulness in basketball techniques was determined with the help of tests' complex. We assessed: basketball techniques' fulfillment and their quantitative parameters (quickness of dribbling, passes, movements and accuracy of hitting in basket). Every student was offered to fulfill 7 tests, by results of which we assessed their techniques. Every test was assessed by 12-points' scale.

Results: We proved that for students, who did not practiced basketball trainings beforehand, it is possible to master basketball material. For saving time it was envisaged to master minimal quantity of techniques, required and sufficient for playing basketball. It was found that the technology of concentrated basketball training does not influence on students' somatic health.

Conclusions: Criterion of the mentioned technology's effectiveness was the level of students' mastering of basketball techniques and their basketball playing in general. It is noted that basketball training increases effectiveness of mastering of other sport disciplines. Systemic practicing of basketball resulted in students' success in envisaged by curriculum light athletic and gymnastic.

Keywords: training technology, basketball, game techniques, students.

Introduction

Basketball is one of effective students' physical education means. Basketball facilitates harmonious development, complex and comprehensive influence on organism, health strengthening [11, 20, 22, 32]. Great variety of basketball movements facilitates nervous system and muscular-skeletal apparatus's strengthening, metabilism improvement, all organism's systems' functioning [12, 26, 30]. However, actualstudents' skills in basketball leave much to be disired. The reason of such situation is basketball's insufficient training in school years. It is connected with the follosing: poor sport facilities (absence of gyms, basketball backboards, balls) in schools; imperfect methodic of physical culture classes at schools; in some schools teachers prefer training of other sport games. All these result in absence of most students' skills in basketball. It should be noted that physical education program for higher educational establishments envisages course of basketball [8, 35].

As on to day there are many methodic recommendations and other information sources for basketball trainings. Though, mainly they are oriented on sportsmen's training in groups of sportsmanship [12, 18, 33, 34]. Basketball specialists elucidate in their works questions of history, techniques and tactic of the game. Besides, they study methodic of sport training, organization of competitions. At the same time technology of students basketball trainings has not become a subject of separate research.

Different approaches to training have been developed for students' basketball trainings [4, 5, 8, 19]. The method of concentrated training is in their basis. Such technology stipulates mastering of minimal, but sufficient quantity of techniques for bilateral game. The technology can be realized by compact training during pre-set period [3, 10]. All these ensure for students to participate in bilateral games after the shortest possible time and satisfies students' demand to play and compete instead of training techniques during long time. In basketball trainings authors recommend to fulfill the following procedures: determine minimal scope of basketball techniques and tactic, which would be sufficient for bilateral game; work out micro-technologies of every technique's mastering as well as for independent mastering of every technique; work out meso-technology of tactic training and game training; determine the sequence of techniques' training and their place in curriculum during academic year as well as their connection with other techniques and parts f curriculum; ensure the correspondence of academic material volume to duration of training lesson; form system of control over students' independent work [5, 6, 7, 15]. Such approaches are also used in other kinds of sports. In particular for physical loads' optimization in Judo [14, 23, 24] and students' physical education [17, 21, 27, 28], control of students' motor fitness [29, 31] and schoolchildren's [16, 17, 25]. It permits to improve students' health and avoid excessive physical loads.

So, relevance of the present research is conditioned by basketball importance as physical education mean. It should also be added that working out of technology of students' concentrated training requires certain substantiation.

The purpose of the research: optimization of basketball training technique in technology of students' concentrated training.

The purpose determines the following *tasks of the research:*

Characterize influence of the worked out technology on students' physical condition and physical fitness. Assess the level of students' mastering of basketball techniques and basketball in the whole.

Material and methods

Participants: in pedagogic experiment 55 1st year students of pedagogic university participated. The

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students were divided into control group (CG) (12 boys and 15 girls) and experimental group (EG) (14 boys and 14 girls). All participants were informed about aims and conditions of experiment and gave their consent.

Organization of the research: the research was being fulfilled during one academic year. At the beginning of experiment we determined groups' homogenity by physical fitness and physical condition indicators. Trainings in EG and CG had similar and distinctive features. Similar features: in both groups trainings were conducted in compliance with acting program, except sport games' part. Distinctive features: CG students trained basketball in school. EG students did not train basketball in school. EG studentds trained basketball by concentrated technology in experiment.

In total 72 hours were stipulated by curriculum per academic year (36 hrs – 1st semester and 36 hrs – 2nd semester). EG students trained only basketball during 20 hours in 1st semester; the rest time (16 hours) they mastered volleyball material. CG students trained volleyball during planned 10 hours, basketball (10 hours) and football (6 hours). In mastering other parts of academic program there were no distinctions [13].

In EG, during time assigned for sport games, students concentrated trained minimum of basketball techniques, which permit to ply bilateral game. In the process of experimental technology implementation in EG we followed the rule: training of one holistic game instead of separate techniques of one or different games. In this time, in CG students mastered basketball techniques and trained other sport games. At the end of academic year we assessed mastering of basketball techniques and playing basketball [5, 9]. Besides, we registered and compared indicators of both group students' physical condition and physical fitness.

In experiment we used: physiological methods (pulse measuring for Robinson's index and Ruffiet' index; spirometry – for life index; dynamometry – for power index; express assessment of physical health (by G.L. Apanasenko); pedagogic observation. Testing was used for assessment of basketball techniques' mastering level [5]. The techniques (catching and passes of ball, dribbling, stops and throws) were assessed by 12-points' scale. If technique was fulfilled with mistakes, from 12 we deducted points for mistakes [5]. Quickness and efficiency of basketball techniques; fulfillment were also assessed by 12 points' scale. Physical fitness was assessed with tests for physical fitness (60 m, 1500 m, 4x9 m run; quantity of torso risings in sitting position and pressing ups in lying position; long jump; flexibility) [1].

Effectiveness of students' concentrated basketball training technology was evaluated with the help of pedagogic experiment. Criterion of the mentioned technology's effectiveness was level of students' mastering of basketball techniques and their ability to play basketball in general. Besides, we determined indicators of students' physical fitness and somatic health.

Physical fitness level was determined in both groups at the beginning of experiment. At the beginning of experiment we found no noticeable distinctions in physical fitness of EG and CG students ($p>0.05$).

Statistical analysis: the results of the research were processed with variation statistic methods, implying finding of mean arithmetic (M), arithmetic error (m), mean square deviation (σ) and confidence of differences by Student's t-test (p).

Results

Application of basketball training's experimental technology positively influenced on EG students' physical fitness. After experiment EG boys demonstrated better results in dexterity and endurance ($P<0.01$). EG students' speed-power indicators significantly improved, comparing CG students' indicators.

Before experiment most of CG students (54%) and EG students (51%) had average level of physical fitness. Part of CG and EG students had physical fitness higher than average: accordingly 39% (girls - 57%, boys - 21,5%) and 29.5% (girls 27%, boys 33%). 15% of EG students had physical fitness level below average (girls 13%, boys 17%) and 7% of CG (girls 0%, boys 14%). Analysis of physical fitness after experiment showed that in EG quantity of students with physical fitness low level decreased (by 4%), below average (by 4%) and average (by 19%). Quantity of EG students with physical fitness above average increased by 22%; with high level – by 4%. In CG we did not register any changes in physical fitness level. In CG 14% of girls came from level above average to average level.

In some tests (shuttle run 4×9m and 1500 meters' run) we observed substantial differences between CG and EG students after experiment. In the rest of EG indicators we observed tendency to their increment. Accordingly, percentage of students' quantity in different groups of physical fitness also changed. It was evidence that on individual level physical fitness changed to the better.

One of criteria of experimental technology's effectiveness assessment was its influence on students' health. Somatic health was determined by methodic of G.A. Apanasenko [1]. By results of morphological functional indicators no noticeable differences were detected between CG and EG students ($P>0.05$).

The received indicators (body height, body mass, vital capacity of lungs, hand dynamometry, heart beats rate, blood pressure, life and power indices, Robinson's and Rouffiet's indices) were used for determination of somatic health by methodic of G.A. Apanasenko. It should be noted that after concentrated basketball training technology's realization there were found no statistically confident changes ($P>0.05$) in functional tests' results in CG and EG. It permits to say that the offered technology influences on students' health in the same way as traditional trainings methods (see table 1).

As far as the main task of experimental technology's working out and realization was to train students to basketball, one of main criteria of students' ability to play basketball assessment was determination of their basketball techniques' mastery.

Table 1. Indicators of students' physical health before and after experiment

Functional tests			Life index, ml/kg		Power index,%		Robinson's index, conv.un.		Rouffiet's index, conv.un.	
Sex			Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
After experiment	CG	M_x	52	54	49	53	89	96	11	12
		± m	2.5	2.3	2.3	1.8	3	4.5	0.7	0.6
	EG	M_x	56	50	55	50	94	90	10	11
		± m	2.2	2.3	3	0.8	2.6	2.5	0.6	0.5
	t		1.2	1.1	1.6	1.4	1.2	1	1.5	0.8
	P		>0.05	>0.05	>0.05	>0.05	>0.05	>0.05	>0.05	>0.05

Table 2. Students' mastery of basketball basic techniques

Techniques	Sex n	CG M_x	± m	EG M_x	± m	t	P
Ball's catching and passes with two hands from chest, points	Boys	8.1	0.3	8.3	0.5	0.3	p>0.05
	Girls	6.4	0.3	8.6	0.5	3.8	p<0.001
One arm's pass from shoulder, points	Boys	7.07	0.26	8.42	0.49	2.43	p<0.05
	Girls	6.14	0.33	8.2	0.38	4.11	p<0.001
Dribbling, points	Boys	7.21	0.38	8.33	0.37	2.12	p<0.05
	Girls	6.93	0.5	8	0.53	1.47	p>0.05
Stops after two steps and turns, points	Boys	6	0.4	7.3	0.5	2.3	p<0.05
	Girls	5.4	0.4	7.7	0.4	4.4	p<0.001
Two arms' throw from chest, points	Boys	7.36	0.34	7.83	0.47	0.82	p>0.05
	Girls	6.86	0.33	8.67	0.49	3.06	p<0.01
One arm's throw from shoulder, points	Boys	6.29	0.37	8.83	0.41	4.62	p<0.001
	Girls	6.07	0.34	7.66	0.37	3.17	p<0.01
Throw from double step, points	Boys	6.07	0.41	8.75	0.7	3.28	p<0.01
	Girls	5.71	0.28	8.87	0.47	5.82	p<0.001

Notes: CG – control group, EG – experimental group.

Table 3. Quickness and efficiency of basketball techniques' fulfillment

Techniques	Sex n	CG M_x	± m	EG M_x	± m	t	P
20 accurate passes by two hands from chest to the wall at 1.5 m distance	Boys	5,2	0,43	6,45	0,68	1,91	p<0,1
	Girls	4,86	0,52	6,4	0,56	2,01	p<0,1
20 accurate passes by one arm from shoulder to the wall at distance 2 meters	Boys	6,5	0,69	6,6	0,69	0,08	p>0,05
	Girls	4,5	0,79	6,53	0,56	2,09	p<0,05
Left hand and right hand dribbling (2×18m)	Boys	5,14	0,59	6,7	0,82	1,4	p>0,05
	Girls	6,29	0,55	6,67	0,63	0,45	p>0,05
Ball dribbling (24 m) by farther hand bypassing stands (every 6 meters)	Boys	5,92	0,69	6,58	0,64	0,69	p>0,05
	Girls	4,64	0,67	6,33	0,53	1,96	p<0,1
20×5m moving by side step in basketball player's stance	Boys	6,4	0,6	6,42	0,63	0,01	p>0,05
	Girls	6,71	0,44	6,6	0,51	-0,16	p>0,05
Quantity of hits in the basket from 15 attempts (5 attempts from the left, 5 from the right and 5 from the front) at distance of 1.5 meters (for girls) and 2 meters (for boys)	Boys	6,57	0,5	8,25	0,59	2,17	p<0,05
	Girls	5,64	0,44	7,53	0,44	3,04	p<0,001
Quantity of hits in the basket from 7 attempts after dribbling by side step	Boys	4,9	0,7	7,5	0,83	2,38	p<0,05
	Girls	4,21	0,58	6,4	0,77	2,25	p<0,05

The level of basketball techniques' mastery was registered with the help of tests' complex for assessment quantitative parameters of basketball techniques, fulfilled by students (quickness of dribbling, passes, movements, hitting basket). 7 testes were offered to every student. Each test was assessed by 12 points' scale. 12 points were given

for test's fulfillment without mistakes. If any mistakes, some points were deducted from 12 for the mistakes.

As far as at the beginning of experiment experimental group students had no skills in basketball techniques, testing results of control and experimental groups were compared at the end of experiment.

Results of tests for students' mastery of basketball basic techniques show the advantage of EG students, comparing with CG (see table 2) In 50% of tests EG boys demonstrated statistically confident better results than CG boys. EG girls were better than CG girls in 78.6% of tests ($p<0.05$). EG students also demonstrated better results in quickness and efficiency of basketball techniques' fulfillment (see table 3).

In bilateral basketball game EG students' actions were better than the same of CG. For assessment of students' skill in playing basketball we used the record of observations [9]. It was found that CG students gained 5.4 ± 0.6 points per one game, while EG students – 7.8 ± 0.5 points ($p<0.05$). Results of EG and CG matches showed advantage of EG both by results of the game and by mass character of basketball techniques' mastery. In EG all students participated in game. In CG not all students demonstrated ability to play basketball.

Between CG and EG groups 3 bilateral games were conducted, separately between girls' teams and between boys' teams (two times, 12 minutes each). It was found that EG boys won 2 games from 3 (with insignificant difference in scores: 34:28; 28:33; 38:32). Girls won 3 games from 3 with high difference in scores (24:6; 32:10; 42:12).

Discussion

Results of our study proved the data [8, 10, 11], that basketball practicing facilitates development and improvement of players' physical qualities. Our researches showed that to the largest extent they influence positively on endurance, dexterity and speed-power qualities. The worked out technology did nor impact noticeably on students' somatic health. Average health index of EG and CG boys and girls corresponded to low health level that is one more prove of modern youth's low health level.

Results of students' functional tests proved the data of other reseraches [20, 22]: basketball trainings positively influence on students' health. We also proved the fact that for assessement of students' ability to play basketball it is purposeful to use records of observations [26, 30]. Objectiveness of assessment results by the records of observations is confirmed by results of games, carried out between the tested groups.

Scientists [2, 5, 32] note that basketball trainings improve effectiveness of mastering of other curriculum disciplines. Our results prove these data. Systemic practicing of basketball means resulted in students' successful mastering the envisaged by curriculum material of light athletic and gymnastic.

The novelty is the data about specific aspects of students' basketball training. We proved that it is possible to train basketball those students, who did not practice basketball beforehand. For saving time it was stipulated to master minimal quantity of techniques, required and sufficient for basketball playing. The received testing results show efficiency of the implemented technology of students' basketball training.

Results of testing techniques' mastery and the game itself witness that it is possible to successfully apply concentrated method of basketball trainings. It was determined that this technology permits to sustain and improve general physical qualities in the process of students' physical education. This, experimentally tested technology of basketball training can be applied in educational establishments, which seek for optimization of educational process.

Conclusions

Implementation of concentrated basketball training technology improved physical fitness of EG students. After experiment EG boys showed better dexterity and endurance indicators ($p<0.01$) as well as speed-power indicators. The worked out technology did not noticeably influence on somatic health of the participants.

EG students mastered basketball techniques better than CG. EG boys demonstrated statistically confidently better results in 50% of tests. CG girls in 78.6% of tests yielded EG girls ($p<0.05$). Results of games between CG and EG teams show better mastery of material by EG students.

The prospects of the research: the present work does not open completely all aspects of effectiveness of students' basketball training technology. In the future we intend to test its effectiveness and influence on students' cognitive processes and field of vision.

Conflict of interests

The author declares that there is no conflict of interests.

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