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Effects of Basketball Practice on Developing Distributive Attention

Ionela Cristina NAE^{1*}

Abstract

*Via the nature of its rules, basketball is both a way for physical training as well as a sports branch which contributes to coordination movement, forming a rapid adaption method to everyday life and inclusion in society. Practicing basketball helps athletes develop their personalities by enhancing thought and decision making speed followed putting everything into action. In this game, distributive attention is the capacity of simultaneously figure out multiple information packages. It can be achieved when exercises are automated and all the info known. Attention distribution is a quality which can be transferred to everyday life bringing important benefits. **Objectives.** By the means of this study we aim to highlight that through basketball we can really contribute to developing distributive attention. **Methods.** Research was conducted on 12 female students, aged 20-23, all being members of the Bucharest Economic Studies Academy basketball representative team. The experimental batch was tested using the "Prague test" in two testing moments - T1 and T2 (October 2016 - May 2017). This research was done for 28 weeks (the length of a university study cycle). **Results.** The "Prague test" revealed significant results for the experimental batch on their final evaluation on 3 out of 4 testing moments and also in total correct answers. In minutes 4,8 and 16, as well as in the number of correct answers, with the help of t testing, p recorded values smaller than 0.05, which confirmed the research hypothesis. **Conclusions.** By analyzing all scientific data the researchers managed to confirm the study hypothesis, meaning distributive attention can be improved via basketball specific exercises.*

Keywords: *distributive attention, basketball, representative teams*

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1. Introduction and problem statement

“Sport under all its forms is a fundamental notion of our daily life having in the core of action the human being upon which it has effects both from biological, propellant and social point of view” [1].

Basketball is a collective game which stands out through beauty and complexity, enjoying high popularity among students.

Via the nature of its executions, basketball is both a method of physical education and a sport branch which contributes to forming and developing coordinated movement, rapid adaptation to everyday life and collective integration of an individual.

In our work with students *“we aim to form a healthy opinion about physical exercises, its effects and also to pass on the interest and desire for exercising to students”* [2].

Practicing basketball as well as other sports brings many health benefits and *“positively affects nerve activity, stimulating the speed of transmission of nerve inflows with particular effects in the growth of the psyche, by increasing the ability to concentrate”* [3].

“Basketball contributes to the development of athlete personality by enhancing thinking speed and decision making leading to a faster capability of putting things into action” [4].

Within this sport, distributive attention means the ability to process more than one piece of information at the same time. It can be achieved when executions are fully automated and all the information known. Attention distribution is a quality which can also apply in everyday lives of the athletes, granting important benefits.

Knowing the importance of distributive attention in everyday life and by using the help provided by this study, we aim to highlight that through basketball, one can improve this trait.

2. Aims of the research

The following research aims at highlighting the development of distributive attention in female basketball players as well as balancing training methods by choosing the most efficient rational and standard means.

3. Research Methods

Research was conducted on a group of 12 athletes aged 20-23, they being members of the Economic Studies Academy of Bucharest basketball

representative team. The experimental batch was subjected to “The Prague Test” in two testing moments - T1 and T2 (October 2016 - May 2017). Research lasted 28 weeks (full length of a university year) at the sports complex belonging to the above-mentioned institution.

The mentioned test was issued by the Psychological and Technical Institute of Prague and is also known as the Prague distributive attention test. It provides information regarding focus, active behavior, muscle toning, selective orientation and focused concentration on behavioral processes all for achieving the optimum results.

“The test also allows evaluation and global work output measuring of quickness elements as well as fatigue ones“ [5].

The Prague Test consists of 2 pages, one for the subject to work one and the other to use as guidance tool. (See addendum 7). On the second one, a square made out of 100 other smaller squares is shown. In each square a large number is written followed by a lower dimension capital letter (ranging from A to D). The order in which numbers and letters is completely random. Each number only appears once in the specified chart.

On the worksheet (the first one) are 4 vertical columns, with each column being split in 2, on the left side being 25 numbers all one under the other and on the right side a blank space - what the subject is supposed to fill in based on the numbers displayed on the second chart (the subject must write down the letter on the second page corresponding to the number on the first page)

This test was conducted in 4 stages, each stage taking place in a 4 minutes interval, followed by a pause of 1 minute. After each leg of the test a line must be drawn on the first page, corresponding to the last answer (the 25th) followed by turning back the page throughout the duration of the break minute.

The results were evaluated by using a specialized evaluation grid chart and out of the total number of filled in numbers were subtracted the mistakes, resulting in the gross result of every subject. The total number of correctly filled characters was calculated as well as the total number of correct answers for every 4 minutes period.

By using graphic illustration we could appreciate to capacity of subjects to distribute their attention, their stable or fluctuant characters, their resistance to fatigue and of course, their ability to adjust to the task at hand.

Throughout the mentioned 28 weeks of study, the team had had 2 weekly training sessions each being 90 minutes long and containing the following elements:

- Successive jumps on both feet (20 m);

- Successive travelling alternating legs (20 m);
- Standing panel jumps (5 repetitions);
- Running panel jumps with touching marks followed by landing and immediate jump;
- Push-up (8-10-12 repetitions);
- Knee flexing (10-20-30 repetitions);
- Accelerated runs (30 m, $\frac{3}{4}$ tempo);
- Normal running from standing position (30 m, $\frac{4}{4}$ tempo);
- Continuous mild running (5-7-10-12 minutes);
- Multiple ball exercises (passes and throws);
- Dribbling, passes and throws (ambidexterity);
- 2-ball dribbling;
- Both hand passes with arms at chest, over the head, ground level, shoulder level, behind and standing positions followed by running and from running;
- Dribbling skill enhancement while in counter-attack and in individual overtaking actions;
- Complex exercises on half the court and on full court length for perfecting standing and jump throwing;
- Ball catching - stop - dribbling - jump throw;
- Ball catching - stop - throw mislead - overtake mislead - dribbling, throw;
- Ball catching - stop - mislead - dribbling overtake under the panel - one-hand throw;
- Ball interception - catch - stop - throw mislead - dribbling - stop - throw mislead - jump throw - rebound;
- Aggressive and interception marking: an exercise of placement between attackers and the ball;
- Actions to intercept the ball through getting the ball out of a dribbling, stopping the dribbling, ripping and holding the ball, capping;
- “Pass and go” on pairs of players: defense - side player; side player - pivot; defense - pivot;
- Double intersection (defense - center - defense; side player - pivot - defense);
- Doubling (pivot - center; center - pivot);
- Sliding, closing off attacks, opponent shifting, double marking (trap) on the ball holder;

- Perfecting counter attack with 2 attacking players, with direct pass and with intermediary pass, with center support and throwing by acknowledging the type of numeric superiority - 2 to 1, 3 to 1, 3 to 2;
- Learning and perfecting the 1-3-1 attack system with lateral and vertical doubling phases of the pivot and center and field player coordination with center and pivot actions;
- Perfecting the one-on-one defense, the aggressive version and the interception one;
- Perfecting the defense system in 2-1-2 area as a base system and for learning the defense system in a 1-2-1-1, 3-2 and 1-2-2 pressing zones;
- Practice games (5 on 5) on half a court and on whole court lengths by applying all learned defense and offense strategies.

Statistic method used

Generally speaking, the number of methods used in research is very large, as each field study has its own instruments [6].

The tracked statistics in this study are: average, median, standard deviation, range, variance, medium difference, correlation coefficient, medium difference significance index and “t” test.

4. Findings

Table 1 shows the results obtained, and in Table 2 the statistical processing of the obtained data.

Table 1 Test results

Nr. Crt.	Subiecți	4'		8'		12'		16'		Total	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
1	D. A.	27	24	18	28	25	18	21	24	91	94
2	R. C.	25	24	19	21	19	20	14	15	77	80
3	C. M.	18	16	17	19	22	23	17	18	74	76
4	C. A.	20	19	23	25	26	27	22	26	91	94
5	P. O.	25	24	24	27	18	18	25	24	92	93
6	V. C.	24	27	21	24	17	15	18	21	80	87
7	S. U.	14	15	16	20	23	22	25	24	78	81
8	B. B.	15	17	17	21	14	19	21	22	67	79
9	C. F.	17	22	22	22	19	17	23	24	81	84
10	T. R.	21	24	23	25	18	21	20	21	82	91

11	V.M.	16	18	19	20	24	22	20	24	79	84
12	A.T.	24	23	22	24	25	24	25	26	96	97

Table 2 Statistical indicator output

Min	Testing										
		Average	Median	Std. Dev.	Max.	Min.	Amplitude	Variance	$m_F - m_I$	Cohen	p
4	I	19.67	20.00	3.92	25.0	14.0	11.0	19.91%	1.42	0.77	0.02145
	F	21.08	22.50	3.90	27.0	15.0	12.0	18.48%			
8	I	20.08	20.00	2.75	24.0	16.0	8.0	13.67%	2.92	1.17	0.00196
	F	23.00	23.00	2.92	28.0	19.0	9.0	12.71%			
12	I	20.83	20.50	3.83	26.0	14.0	12.0	18.40%	-0.33	0.11	0.70718
	F	20.50	20.50	3.34	27.0	15.0	12.0	16.31%			
16	I	20.92	21.00	3.42	25.0	14.0	11.0	16.37%	1.50	0.89	0.01019
	F	22.42	24.00	3.26	26.0	15.0	11.0	14.54%			
Total	I	82.33	80.50	8.53	96.0	67.0	29.0	10.36%	4.33	1.29	0.00096

5. Discussions

At 4 minutes, the average had increased by 1.42 while keeping the data series homogeneously. Cohen shows a medium to high mean difference. The difference is statistically significant, $p < 0.05$, meaning the null hypothesis are rejected, the research one being the accepted one.

At 8 minutes, the mean had increased by 2.92 and with still a homogenous data series. The Cohen index shows a high to very high mean difference. This difference is statistically significant, $p < 0.05$ which rejects the null hypothesis and makes the research one valid.

At 12 minutes, the mean had decreased by 0.33, and with still a homogenous data series. The Cohen index shows a very low mean difference. This difference is not statistically significant, $p > 0,05$ which accepts the null hypothesis and makes the research one invalid.

At 16 minutes, the mean had increased by 1.50, with a modification from relatively homogenous data series to a completely homogenous one. The Cohen index shows a very high mean difference. This difference is statistically significant, $p < 0.05$ which rejects the null hypothesis and makes the research one valid.

At total, the mean had increased by 4.33, and with still a homogenous data series. The Cohen index shows a very high mean difference. This difference is statistically significant, $p < 0.05$ which rejects the null hypothesis and makes the research one valid.

6. Conclusions

Applying the Prague test revealed for the experimental group, significant results on final testing, on 3 out of 4 testing moments and on the total number of correct answers. In minutes 4, 8, 16 as well as in total correct answers, p had smaller values than 0.05, confirming the research hypothesis.

Obtained results confirm the fact that distributive attention is a trait which can be improved by practicing basketball, a quality which is passed on everyday life for any athlete belonging to this discipline, at least.

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