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**CORRELATION OF MOTOR AND TECHNICAL TRAINING**  
**PARAMETERS FOR JUNIOR I BASKETBALL PLAYERS**

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***Abstract***

Currently, the game of basketball involves higher indices of speed ability, which means performing consistent exercise coupled with mental effort. The speed, muscle strength and coordination required in the actions undertaken, as well as the joint mobility and suppleness, make it necessary to develop a sense of the ball, which results in a safety feeling when passing the object of the game (the ball) and precision when executing the actions. Generally, achieving superior sports performance, but in the sports games particularly, has caused most of the specialists (coaches and teachers) and authors of scientific papers to find out and then to maintain that the level of physical training is determining for the training of the athletes. No matter how the basketball game is analysed, with its tactics, it is primarily a match of the anthropometric dimensions, physical skills, closely related to body composition, and in the end, one of the connections with the other components of the sports training which condition one another. In order to assess the influence of motor ability on the level of technical training and vice versa, we used the data analysis of correlative links by calculating the “r” coefficient. The purpose of this experimental research is to optimise the content of physical training programs.

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**Keywords:** Correlation, motor training, technical training, junior I players.



## 1. Introduction

It has become undeniable that global basketball activity has become an objective reality determined both by the general conception of the sport training theory and, implicitly, of the particular concept of deepening and pragmatic application of the knowledge required to achieve performance in this sporting branch, which in the end reflects the scientific and applicative character of this field.

As a result, reflecting the theory and practice of basketball is a set of systematised knowledge in a coherent logical order whose purpose is to describe, explain and communicate the experience, in close connection with the laws and findings obtained as a result of scientific research. Thus, the specific theory of basketball game must be considered as having the characteristics of a flexible, open and dynamic system that facilitates understanding of the complex requirements to achieve superior sports performance.

The game conception, which is specific to current basketball, involves understanding and accepting its features and particularities in promoting training based on a national strategy that directs the training and competition activities of age-specific groups in accordance with international requirements.

## 2. Problem Statement

In their works, many authors are reluctant to correlate their studies with the real content of the game. Indeed, it is very difficult to present this content in a succinct definition, because sport can be and must be considered in its complexity, depending on many parameters belonging to the interdisciplinary approach of different scientific fields: biological, pedagogical, sociological, psychological etc. Sports games are therefore characterised by the predominant manifestation of technical actions, by simultaneous demands and effects, by their global features not only selective, not only motor, but also morphological and functional, and by an increased psychological participation (Predescu & Ghițescu, 2001).

Analysing the practice and theory on increasing the performance capacity at the world level, there are a number of priorities and factors favouring the improvement of training in the field of sports games. Exploiting the human resources, namely children and young people endowed for sports games, is part of an ever-improved strategy and dominated by the permanently selective act.

Nowadays, for all sports games, there is an increase in the dynamics of the efforts made for their development, which is reflected by the increase in the number of actions in attack and/or defence. This situation is a result, on the one hand, of the ever changing regulations, thus favouring an increase in the power of action and, on the other hand, the spectacular character of the competitions and, in response, the sport training requires an approach from the perspective of the efforts with increased intensity (Drăgan et al., 1989).

The amount of the effort, along with its character and orientation, determines the intensity, size and direction of the process of adapting it to the body of the athlete. Concerning the intensity of the effort, in the case of sports games, it is manifested in the fundamental part of the training lesson, usually in terms of the type of means used and the number of executions per minute, which ensures the achievement of the objectives of this approach (Dragnea, 1996; Colibaba-Evuleț & Bota, 1998).

### **3. Research Questions**

In our research we started from the hypothesis that “Selecting the physical training content, based on real and scientific determinations, will lead to the improvement of the execution technique”.

### **4. Purpose of the Study**

The purpose of this experimental research is to optimise the content of physical training programs. By including in the general and specific physical training program of junior I basketball players (aged 17-18 years) exercise structures designed to increase the level of the conditional and coordination abilities and by applying the technical procedures specific to basketball for improving effort, we aim to achieve superior performance in sports competitions.

### **5. Research Methods**

In order to achieve the purpose and objectives of the research and verify the hypotheses, scientific research methods were used as follows:

- Experimental method;
- Measurement and testing method: samples for general, specific, technical training;
- Statistical and mathematical methods of data processing;
- Graphical representation method.

The experimental method is the main research method assuming the establishment and use of a set of conditions through which we will verify the truthfulness of the assumptions formulated for both the preliminary and the main research (Epuran, 1991; Thomas & Nelson, 1996). In our case, the basic experiment consisted in the application of a general and specific physical training program based on exercise structures designed to increase the level of conditional and coordination abilities and the application of basketball techniques to achieve superior performance in sports competitions.

The basic research was carried out on a sample of 13 athletes of the junior group I (17-18 years old) from the Târgoviște School Sports Club, participants in the National Championship.

The baseline experiment was conducted during one competitive year, from July 2013 to May 2014. The subjects pursued their activity according to the training program proposed by us.

### **6. Findings**

The anthropometric measurements made in our research are a significant criterion of individual and collective knowledge and assessment of the somatic development and somatic growth process of junior athletes and, at the same time, the evaluation of the effects of specific physical training on the increase of sport performance. Given the specificity of the basketball game, in which the anthropometric parameters (in particular the height and weight) are essential for the basketball performance, we measured: the height (cm), the body weight (kg), the span (cm), the thorax perimeter in inspiration comparative to expiration (cm). The results of the obtained measurements were interpreted statistically and compared to those found in the literature. The comparative analysis of the average values recorded

during the pedagogical experiment applied to the investigated subjects shows different evolutions at an individual level for all five measurements.

For the waist indicator, the subjects obtained an average of 184.15 cm in the initial test, while the final test was 185.69 cm, showing an increase of 1.54 cm, which is normal for boys at this age. This indicator has improved on average by 0.08%.

In terms of changes in the body weight during the experiment, we can say that the arithmetic mean values were higher by 3.31 kg in the final test.

Regarding the span, the experimental group has an average of 186.76 cm in the initial test and an average of 188.07 cm in the final one, showing an increase of 1.31 cm.

In order to determine the level of general physical training in junior basketball players, measurements were made using six motor tests: 50 m run, bending and stretching of the front legs supported, traction, raising the legs stretched to 90 degrees from the hanger, extension (30 s) and 1000 m resistance. The testing of athletes from both samples (experimental and control) was performed at the beginning and at the end of the pedagogical experiment.

As for the 50-meter speed test, the athletes get a better average of 0.16 seconds in the final test compared to the initial test, which confirms the effectiveness of the exercises used to improve the speed of the motor quality.

In the test for the upper limb strength assessment by bending and stretching the forefinger with arms supported, showing the number of executions that the athlete can make, higher values can be observed with 1.23 executions in the final test, compared to the initial one.

The same improvement trends are also seen in the traction test, where the athletes under study have achieved better performance at the end of the study. This shows an upward trend, with an increase of 0.84 executions more in the final test than in the initial one.

Specific physical training in basketball is the determining factor in winning a match or sports competition. As a result, by comparing the data for the 30 m speed test, we can see an average improvement of 0.16 seconds in the final test compared to the initial test.

From the analysis and comparison of the results obtained by the research subjects in the vertical jump test, it is noted that the results are increasing. Thus, an average of 72.30 cm was recorded at the end of the experiment, compared to 67.61 cm in the initial test - an increase of 6.5% (a difference of 4.69 cm between the tests).

With regard to the Little Marathon, a basketball-specific test characterised by dribbling in terms of technique, speed of execution, speed, accuracy, coordination in game-resisting mode, the group has improved its execution time from 22.56 seconds to 21.96 seconds, representing a 3.4% increase. At the specific test, which is important for achieving sports performance, the differences between the extreme, pivot and extreme players are not very high, which allows us to evaluate the effectiveness of the program for junior I, 17-18 years old. The investigated subjects achieved an average of 11.92 points at the beginning of the experiment, with an improvement of the precision in execution at the end of the experiment, a claim supported by the average of 15.07, thus an average growth rate of 19.4% marked points.

Another basketball-specific control test is that of free throws, a test in which we observe the same refinement trend as in the position-specific one, being more characterised by the individual performance of the athletes than the collective ones. From the calculation of the statistical indicators, there is an evolution of the investigated group, with differences of 1.38 (from a successful rate of 8.0 in the initial testing to 9.38 in the final one), therefore an improved performance by 14.7% on average. Thus, the somatic parameters influence the technical execution and the motor qualities. The weight correlates positively with the bends and stretches of the forelegs lying down and with the waist ( $r = 0.784$  at  $P \leq 0.01$ ). The bends and elongations of the forelegs are supported and influenced positively by the waist / height ( $r = 0.721$  at  $P \leq 0.01$ ) and body weight ( $r = 0.637$  at  $P \leq 0.05$ ).

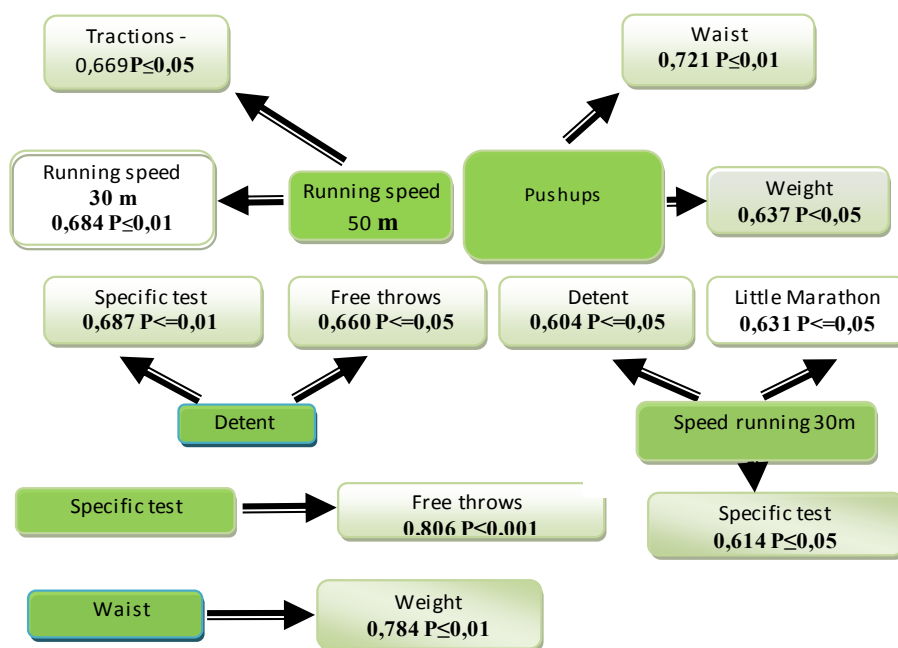
The 50 m running speed influences and is positively influenced by traction ( $r = 0,669$  at  $P \leq 0.05$ ), which allows us to say that the means used to educate the speed of the motor quality can determine the development of upper limb strength and vice versa, thus demonstrating links between the correlated factors (Table 01 and Figure 01).

Running speed over a distance of 30 m, a specific test of the Romanian Basketball Federation, is influenced and correlates positively with 50 m speed ( $r = 0.684$  at  $P \leq 0.01$ ). In turn, the speed run over the 30 m distance influences positively the vertical jump ( $r = 0.604$  at  $P \leq 0.05$ ) and the execution of the specific test ( $r = 0,614$  at  $P \leq 0.05$ ).

The influence of the vertical jump can result in superior qualitative results of the technical execution and rapidity of the specific test ( $r = 0.687$  at  $P \leq 0.01$ ) and an increase in the efficiency of the free throws ( $r = 0.660$  at  $P \leq 0.05$ ).

**Table 01.** Linear correlation

Correlation	Running speed 50 m	Pushups	Tractions	Lifting from hanging	Trunk extension	Running resistance	Running speed 30m	Vertical jump	Little Marathon	Specific test	Free throws	Waist	Weight
	<b>RS 50 m</b>	0.116 $P > 0.05$	<b>0.669</b> $P \leq 0.05$	0.123 $P > 0.05$	0.178 $P > 0.05$	0.131 $P > 0.05$	<b>0.684</b> $P \leq 0.01$	0.341 $P > 0.05$	0.052 $P > 0.05$	0.377 $P > 0.05$	0.249 $P > 0.05$	0.028 $P > 0.05$	0.124 $P > 0.05$
		<b>P</b>	0.232 $P > 0.05$	0.387 $P > 0.05$	0.211 $P > 0.05$	0.518 $P > 0.05$	0.222 $P > 0.05$	0.125 $P > 0.05$	0.410 $P > 0.05$	0.196 $P > 0.05$	0.340 $P > 0.05$	<b>0.721</b> $P \leq 0.01$	<b>0.637</b> $P < 0.05$
			<b>T</b>	0.109 $P > 0.05$	0.244 $P > 0.05$	0.185 $P > 0.05$	0.232 $P > 0.05$	0.125 $P > 0.05$	0.117 $P > 0.05$	0.257 $P > 0.05$	0.222 $P > 0.05$	0.482 $P > 0.05$	0.524 $P > 0.05$
				<b>LH</b>	0.052 $P > 0.05$	0.013 $P > 0.05$	0.331 $P > 0.05$	0.065 $P > 0.05$	0.263 $P > 0.05$	0.257 $P > 0.05$	0.085 $P > 0.05$	0.170 $P > 0.05$	0.128 $P > 0.05$
					<b>TR</b>	0.136 $P > 0.05$	0.130 $P > 0.05$	0.135 $P > 0.05$	0.239 $P > 0.05$	0.077 $P > 0.05$	0.176 $P > 0.05$	0.324 $P > 0.05$	0.214 $P > 0.05$
						<b>RR</b>	0.065 $P > 0.05$	0.058 $P > 0.05$	0.069 $P > 0.05$	0.101 $P > 0.05$	0.200 $P > 0.05$	0.326 $P > 0.05$	0.056 $P > 0.05$
							<b>RS 30 m</b>	<b>0.604</b> $P \leq 0.05$	0.231 $P > 0.05$	<b>0.614</b> $P \leq 0.05$	0.418 $P > 0.05$	0.230 $P > 0.05$	0.299 $P > 0.05$
								<b>D</b>	0.061 $P > 0.05$	<b>0.687</b> $P \leq 0.01$	<b>0.660</b> $P \leq 0.05$	0.110 $P > 0.05$	0.261 $P > 0.05$
									<b>MM</b>	0.036 $P > 0.05$	0.199 $P > 0.05$	0.305 $P > 0.05$	0.408 $P > 0.05$
										<b>ST</b>	<b>0.806</b> $P \leq 0.001$	0.214 $P > 0.05$	0.071 $P > 0.05$
											<b>FT</b>	0.406 $P > 0.05$	0.002 $P > 0.05$
												<b>WA</b>	<b>0.784</b> $P \leq 0.01$
													<b>WE</b>



**Figure 01.** Configuration of correlated factors

The results recorded in the two technical tests (the specific test and free throws) influence each other ( $r = 0.806$  at  $P \leq 0.001$ ).

## 7. Conclusion

The recorded results allow us to say that a good vertical jump can influence the performance of the player by position, the tractions, the bends and stretches of the supported arms, which is correlated positively with the free throw test.

Correlative links between physical evidence and technical evidence demonstrate that the development and improvement of physical qualities by using the technical and tactical structures specific to basketball in the training process has contributed to the development of motor indicators, which in turn have influenced the superior manifestation of technical executions.

We can consider the motor qualities as being influenced by the means, the technical-tactical structures used for the improvement of technical executions, as well as the somatic parameters.

Therefore, the positive evolution of the indicators investigated following the application of the proposed training program validates the operational structures used.

This is also confirmed by the experimental research hypothesis that “Selecting the physical training content, based on real and scientific determinations, will lead to the improvement of the execution technique”.

No matter how the basketball game is analysed, with its tactics, it is primarily a match of the anthropometric dimensions, physical skills, closely related to body composition, and in the end, one of the connections with the other components of the sports training which condition one another.

## References

- Colibaba-Evuleț, D., & Bota, I. (1998). *Jocuri sportive - Teorie și metodică*. București: Aldin.
- Drăgan, I. (coord.). (1989). *Medicină sportivă*. București: Sport-Turism.
- Dragnea, A. (1996). *Antrenamentul sportiv*. București: Editura Didactică și Pedagogică.
- Epuran, M. (1991). *Metodologia cercetării activităților corporale*. București: ANEFS.
- Predescu, T., & Ghișescu, G. (2001). *Baschet. Pregătirea echipelor de performanță*. București: Semne.
- Thomas, R. J., & Nelson, J. K. (1996). *Metodologia cercetării în activitatea fizică* (Vol. I). București: MTS.