Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XVIII, ISSUE 2 Supplement, 2018, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST,
DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengage Learning, Cabell's Directories

Science, Movement and Health, Vol. XVIII, ISSUE 2 Supplement, 2018
September 2018, 18 (2 supplement): 396 - 402
Original article

ANALYSIS OF THE SOMATIC DEVELOPMENT LEVEL OF JUNIOR BASKETBALL PLAYERS U18 – NOTE I

SAVU CRISTIAN FLORIAN[1], PEHOIU CONSTANTIN[1]

Abstract

Objective. The study aims at assessing the level of physical development of basketball players at the age of 17 (18-18 years), which will base the design and implementation of a training program aimed at improving the functional, morphological and motivational changes needed to achieve superior sports performance.

Methods. The study was conducted on a sample of 26 athletes comprised of the junior group I (17-18 years old) of the Târgovişte School Sports Club and the Ploieşti School Sport Club participating in the National Championship. We note that the 26 athletes were divided into two groups, taking into account the origin of the club they belong to, follows: a number of 13 subjects (athletes of the Târgovişte School Sport Club) are members of the experiment group, and the rest of 13 - subjects are athletes of the Ploieşti School Sport Club, members of the control group.

Results. In terms of height (cm) / cm, this requirement is met by the pivots of the experimental group (194cm) and even by 1.3cm by the same type of players in the control group (195.3cm compared with 194cm imposed by the federation model). Both teams meet the requirements for participation in the championship which requires the presence of a team composed of at least one player or two 199cm and 194cm. With respect to weight, both groups have players approaching the values recommended by the federation. For example, the experiment group has a 92kg player and a 96kg control group, which confirms that the teams have gaming players who can cope with the battle under the panel. Closely related to the height, width of arms is an important indicator for basketball. And at this indicator, the obtained media are inferior to that proposed by the F.R.B. Regarding the thoracic perimeter, it is noted that the pivoted players of the two groups have lower values of chest elasticity between 4,33cm (control group) and 5cm (experimental group).

Conclusions. Analyzing the data recorded in the preliminary testing for anthropometric measurements and comparing them with the model elaborated by F.R.B., it is found that both the experimental group and the control group subjects do not meet the requirements of the performance model for this age.

Key Words: somatic deployment, basketball, junior U18.

Introduction

At present, the sport performance and its achievement highlight the importance of the steps in the training process, the ways of transmitting the methodical information, the exercise in a didactic system with correction-regulating functions based on the feedback phenomenon. From this point of view, experts consider that sports performance in teaching / learning is subject to goals and content programming to harness the skills, talent, motivation and aspirations of any athlete (Dragnea, 1996).

Over time, it has been considered that complex physical training, percisely the simultaneous development of all conditioning and coordination capacities, must be a basic principle in the training of athletes, regardless of the profile of the requests. Experimental research and careful observations invalidate the validity of this principle in any situation.

In their works, many authors hesitate to correlate the problem of real sporting content. Indeed, it is very difficult to present this content in a succinct definition, since sports play can and must be considered in its complexity, depending on many parameters belonging to the interdisciplinary approach of different scientific fields: biological, pedagogical, sociological, psychological and so on. Sports games, therefore, are characterized by the predominant manifestation of technical actions, simultaneous demands and effects, of a global nature and not only selective, or motric but also morphological and functional, plus an increase in participation mental (Predescu & Ghițescu, 2001).

Analyzing the practice and the theory of

Department of Physical Education and Sport, Faculty of Human Sciences, Valahia University of Targoviste, Street. Lt. Stancu Ion, no. 35
E-mail address: savufcristian@yahoo.com, tel. +40722359419; cpehoiu@yahoo.com, tel. +40742019638.
* the abstract was published in the 18th I.S.C. "Perspectives in Physical Education and Sport" - Ovidius University of Constanta, May 17-19, 2018, Romania
Received 10 march 2018 / Accepted 5 may 2018

increasing the world's performance capacity, there are a number of priorities and factors favoring the improvement of training in the field of sports games. The use of human resources, children and young people gifted to practice sports games is an ever-improved strategy and dominated by the permanent selective act.

The information provided by the literature reveals that the discovery of sporting talent, his subsequent selection, influences, in a 70 percent, the evolution of a high performance sportsman (Ifrim, 1993). Some authors, disclose the selection criteria of the hogh performance player model: the somatotype, the physiotype or the ergotype (movement capacity), and the psychotic or psychic characteristics. Thus, the superior valorisation of the player is based on the relationship between his bio-psycho-motor capabilities and the requirements of a performance model (Predescu & Ghițescu, 2001).

Nowadays, in all sports games there is an increase in the dynamics of the efforts made in their development, which is reflected in the increase of the number of actions in the attack and / or defense. This situation is a result, on one hand, of the ever changing regulations, thus favoring an increase in the power of action and, on the other hand, the increase of the spectacularity of the competitions, and in response, the sport training requires an approach from the perspective of increased intensity efforts (Drăgan & colab., 1989).

The size of the effort along with its character and orientation determines the intensity, size and direction of the process of adapting 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 as to the type of means used and the number of executions per minute that ensures the achievement of the objectives of this approach (Dragnea, 1996).

Age peculiarities are native, morphologically and psychologically acquired characteristics. They differ according to their respective ages, relate to the individual and differentiate them within a collective through some specific features.

Growth and development indicate those successive, complementary processes that act on the biological parts of the human body in the direction of quantitative accumulations, functional specialization and organization, the qualitative modification of the biochemical structure, and their degeneration with the transition from one age category to another. The literature shows that development and growth do not proceed at a uniform pace, but in the course of time there may be periods of slowing down, variable increases (Drăgan & colab., 1996).

At the age of adolescence, the individual changes his self-perception, including that related to body schema, as a way of expressing one's own identity. Biological, intellectual and moral maturation makes its presence felt progressively, being visible in the displayed behavior, self-seeking being replaced by manifestation of the self. At the same time, the place of the somatic rapid changes in the pubertal stage is taken over by much slower processes that are appropriate, first of all, to reduce height growth (obviously for girls) and segmental diameters and perimeters. At the functional level we are witnessing the maturation of neuro-endocrine system coordination structures, which is seen in the process of balancing the superior realization and regulation of motor acts and actions. From a motoristic point of view, the adolescent's responses to requests in this category get complex, expressive and varied features corresponding to improving the skill to observe / discover the revealing elements for effective motor behavior (Dragnea & Bota, 1999). The correct assessment of growth and development processes at the age of adolescence (with reference to our case, between 17 and 18 years of age) involves addressing changes from a somatic, functional, psychological and motorized perspective as follows:

- Regarding the rhythm of growth and somatic development, there is a slowdown. However, the slow-change of the bones continues in a slow way, in contradiction with the rhythm of their increasing volume - the values of the diameters and perimeters are increasing and becoming appreciable as compared to the age of the previous age. At the same time, there is a continuation of the height increase of the boys compared to the almost definitive stagnation of the girls, because at the age of 17-18 years of age their size increases by approximately 2 cm per year. Harmonization of body proportions, as well as a clear improvement in coordination capacity, has been observed, thus increasing the possibilities for improving motor capacity. The definition of the ossification of other skeleton components occurs differently, but generally the bones have the shape and the final dimensions, and the bonding of primary and secondary centers specific to ossification takes place later, at 22-25 years.
- There is now an increase in muscle mass (hypertrophy) as evidenced by the increase in diameter of muscle fibers, with the muscular system accounting for approximately 44% for boys and 37% for girls of total body weight. The size of the physiological section of the muscles conditionally, proportionally, forces the development of the force,

but which is left behind by the adults. According to the data, at this age, a physiological section of muscle of one cm2 develops approximately 10 kgf. This rule recognizes two exceptions as valid. On one hand, female exceprions are included, under the same conditions of age, develop for the same area of the physiological section between 7-8 kgf and, on the other hand, the young physical exercise practitioners, on which the value the indicator kgf / cm2 of section, reported in the training, exceeds the average. It is estimated that during this period the body weight changes on average by 3-5 kg / year, which are valid for both girls and boys. Thus, the well-represented muscular system alongside the existence of favorable neuromotor coordination and an increased learning, restraint and stabilization capacity, become the basis for improving the motor performance capacity in the sports training process, the effort being characterized by volume and intensity, imposed by the stability of hormonal secretions, especially the hypothalamo-pituitary axis involved in proper and effective regulation (Bota, 2000). Some authors are of the opinion that at the age of 17-18 years, without an adequate approach to strength training, the level of manifestation of this motorized quality is reduced in value compared to speed and motor coordination, expression parameters the latter being close to those of adults. The same author states that both the permanent state of mild muscle tension (muscle tone) and the ability to withstand static effort have high values (Alexe, 1993).

- Under the morphological aspect, at the end of this age period, the cardiovascular system records an accelerated developmental pace in terms of the volume and weight of the myocardium muscle as well as the vascular network serving the skeletal muscles and the peripheral organs of the body, an increase in functional capacity.
- The respiratory system records maturation, approaching morphologically to the adult, amplifying the dimensional factors and increasing the contact surface between the capillary and alveolar blood. The chest cavity increases its volume compared to that of the limbs, which leads to an increase in the Erismann index values (proportionality index).
- Around the age of 17-18, the brain reaches its maximum weight, mental functions develop multilaterally, and the nervous system, at an appropriate level of development, controls and regulates the smooth functioning of the body.
- The morphological analyzer has the characteristics close to those specific to adults. Regarding sensory-perceptive development, adolescence can highlight the following aspects: visual acuity can be maximally exploited; hearing and skin sensitivity have important changes.

Methods

In the study we proceeded from the following hypothesis, namely the assessment of the physical training of junior basketball players I, based on the model of the specialized federation, can highlight the morpho-functional and motor changes induced during the training process.

The study was conducted on a sample of 26 athletes comprised of the junior group I (17-18 years old) of the Târgoviște School Sports Club and the Ploiești School Sport Club participating in the National Championship. We note that the 26 athletes were divided into two groups, taking into account the origin of the club they belong to, as follows: a number of 13 subjects (athletes of the Târgoviște School Sport Club) are members of the experiment group, and the rest of 13 - subjects are athletes of the Ploiești School Sport Club, members of the control group.

In order to achieve the purpose and objectives of the research, respectively the verification of the hypothesis, scientific research methods established as follows (Epuran**,** 2005):

- pedagogical observation;
- scientific and methodological documentation;
- method of measurement and testing;
- statistical and mathematical methods of data processing;
- the graphical representation method.

In the study, we considered four indicators of anthropometric development. Tests were conducted to determine the level of physical development at the age of junior I (17-18 years), in order to compare these results with the requirements of the federation of specialists (F.R.B.). We mention that the tests were conducted under the same conditions for all subjects involved in the research and concerned: height, weight, width of arms, chest perimeter in inspiration – expiration.

Results

Assessing the growth and physical development of juniors is a must in order to appreciate the morphological, functional and motivational changes that take place through the efforts of high intensity, volume and complexity. Analyzing the data recorded in the initial testing for anthropometric measurements and comparing them with the model elaborated by F.R.B., it is found that both the experimental and the

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control group subjects do not meet the requirements of the performance model for this age.

Table 1. Values of averages obtained by the two groups for anthropometric measurements, compared to the model F.R.B.

The post		Quarterback			Extreme			Pivot		
Group		EG	CG	F.R.B.	EG	CG	F.R.B.	EG	CG	F.R.B.
Height (cm)		179	179,6	**180**	183,4	183,6	**188**	194	195,3	**194**
Body weight (kg)		67,6	67,4	**80**	68,8	73,8	**90**	82,6	86,6	**100**
Width of arms (cm)		181,6	182,2	**193**	186,6	186,4	**199**	195,6	194	**210**
Chest perimeter	Inspired	95,4	94	-	95,2	95,6	-	101,6	100,6	-
	Expired	89,8	89,4	-	89	89,8	-	96,6	96,3	-
	The difference	5,6	4,2	-	6,2	5,8	-	5	4,33	-

Regarding the comparison of the values for the anthropometric measurements of the two groups (experimental group and control group), there is an advantage in favor of the height and weight control group, while the experimental group has better outcomes and thoracic perimeter.

Height

In terms of height, the two teams' defending players have lower values than the federation model with 1cm for the experimental group and 0.4cm for the control group. For players specializing in extreme positions, the values of the same indicator are lower than the federation model requirements of 4.6cm (experiment group) and 4.4cm (control group) respectively.

This requirement is found to be met by the pivots of the experimental group (194cm) and even exceeded by 1.3cm by the same group of players in the control group (195.3cm compared with 194cm imposed by the federation model) - Figure 1. Both teams meet the requirements for participation in the championship that require the presence of a team at least one player of 199cm or two 194cm. Both groups exhibit a very good degree of homogeneity, the coefficient of variability having values below 10%.

Body weight

The experimental group had an average of 71.53kg and the control group averaged 74.30kg. The defensive players record lower average values, 67.6kg and 67.4kg respectively, compared to the 80 kg F.R.B. model. For players on the extreme post, the recorded values are inferior to the requirements of the 90kg model. The experimental group had an average of 68.8kg and the slightly better average control group of 73.8kg (Figure 2). The federation model requirement for this indicator is 100kg for pivots. Both groups have players approaching the values recommended by the federation. For example, the experiment group has a 92kg player and 96kg control group, which confirms that the teams have gaming players who can cope with the fight under the panel.

The individual values influence the homogeneity of the groups that is relatively good, the coefficient of variability is having values above 10%.

Width of arms

Closely related to the height, scale is an important indicator for basketball. And at this indicator, the obtained media are inferior to that proposed by the F.R.B. The defensive players recorded an average of 181.6 m in the experimental group and 182.2 cm in the control group, with a lot of values (difference of about 11 cm) below the requirements of the specialized federation (193 cm) for such a post. Similarly, for the players on the extreme and pivot positions, the media result is below 199cm (extreme) and 210cm (pivots). For example, the average experimental group for pivots is 195.6cm, which means a difference of 14.4cm, and those in the control group of 194cm, meaning a 16cm difference, which is below the average of the model requirements F.R.B. (Figure 3).

For this indicator, the values of the variability coefficient indicate very good homogeneity for both groups.

The thoracic perimeter

In assessing the level of development and functioning of the respiratory system, a particularly important element is the examination of the thoracic box, the chest perimeter in inspiration and expiration, and especially the difference between them, which gives us the pulmonary elasticity (Table 1).

For Basketball players, pulmonary elasticity

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varies between 4-12 cm, the values being dependent on the position of the team athlete.

It can be noticed from the data obtained that the pivots of the two groups exhibit lower values of chest elasticity between 4,33 cm (control group) and 5 cm (experimental group).

This aspect is also due to the technical exercises specific to the post, the defense and the fight under the panel etc., which by their biomechanics performs the blocking of the musculature and the thoracic box, and over time these blockages lead to the decrease of the thoracic mobility and implicitly of the pulmonary capacity.

The players on the extreme positions and defenders of the experimental group have better values between 5.6cm and 6.2cm, and the control group of the extreme players is 5.8cm (Figure 4).

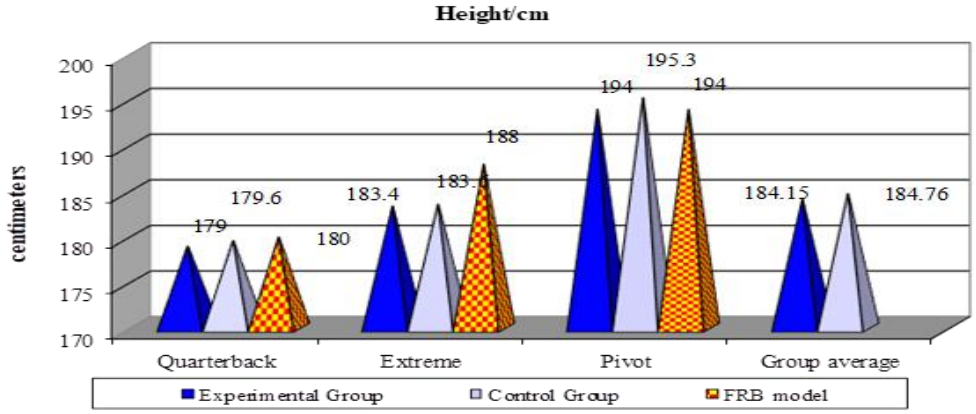

Figure 1. Graphic distribution of comparative mean values on *height positions*

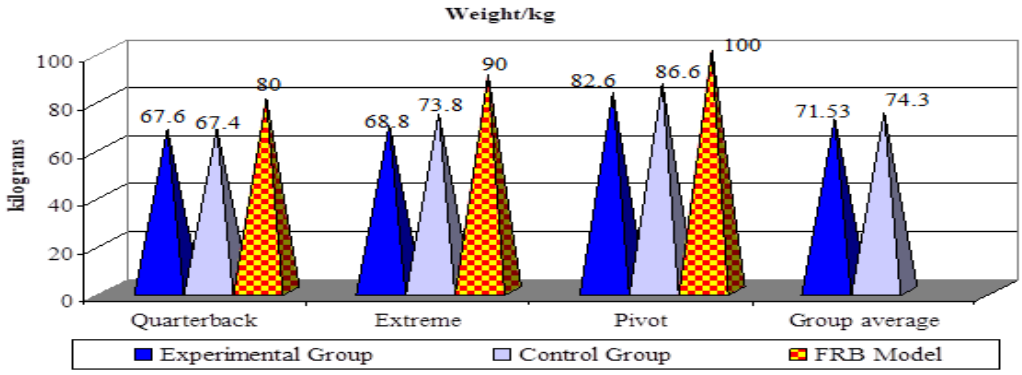

Figure 2. Graphic distribution of comparative mean values for *weight*

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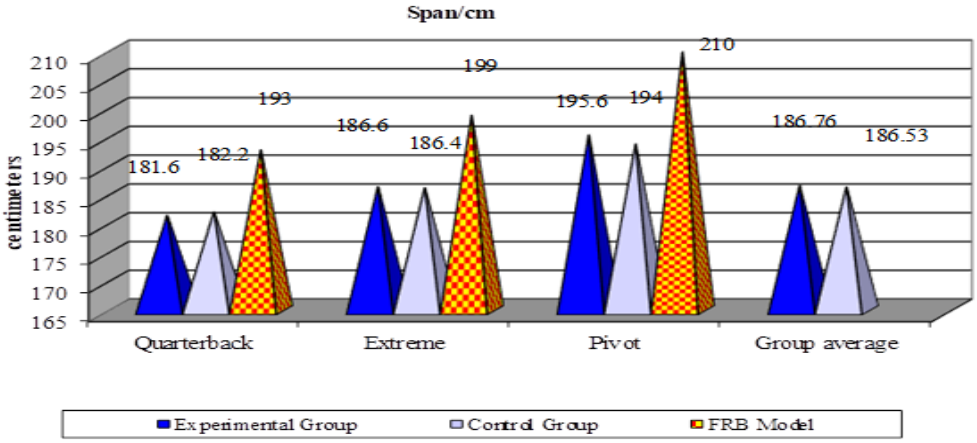

Figure 3. Graphic distribution of comparative mean values for *span*

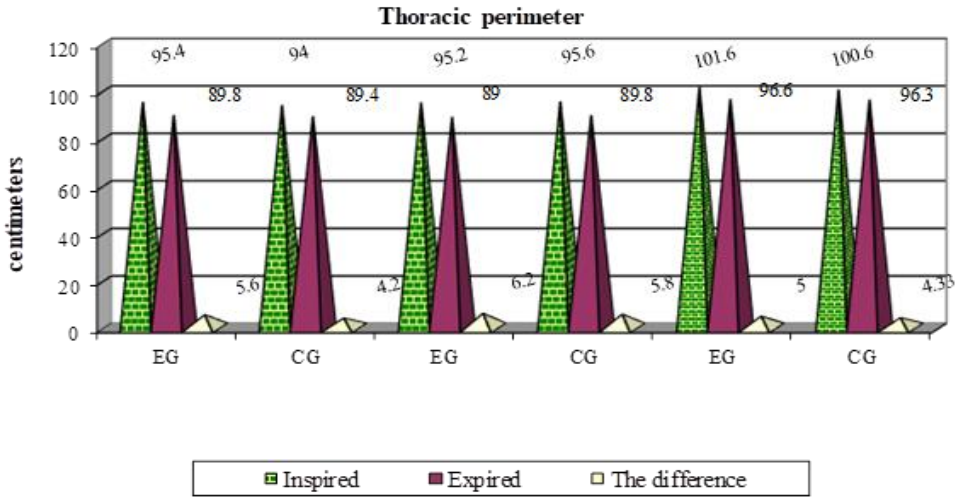

Figure 4. Graphic distribution of comparative mean values for *thoracic perimeter*

Discussion

General and multilateral physical training - is a process directed towards achieving appropriate physical and motor development, achieved through selective or global exercise. General physical training has as its primary goal, with no exceptions to the branch or sports practice practiced, an increase in the ability to make the effort. Thus, it is considered that an increased level of work potential favors the adaptation of the athlete's body to the ever-increasing demands imposed by the physical and psychological training. By analogy, it is deduced that a general physical training carried out at a higher level will result in unlocking the untapped possibilities of the athlete, which will be reflected in the high level expression of the motoring qualities it tends to be. In the case of the development of general physical training, the main focus is on the development of general resistance. With physical resistance, the basketball player also performs the skills of willpower, deafness, which helps to overcome fatigue and negative feelings during a demanding driving activity. As a process, general physical training is geared towards guaranteeing and developing a broader sphere with complex features of the components of motor capacity (motor qualities, skills and motor skills), somato-functional indexes that favor the achievement of specific physical training and with a technical, tactical and psychic character.

Conclusion

Analyzing the data recorded in the preliminary testing for anthropometric measurements and comparing them with the model elaborated by F.R.B., it is found that both the experimental group and the control group subjects do not meet the requirements

of the performance model for this age.

In terms of height, the defending players of the two teams have lower values than the federation model with 1cm for the experimental group and 0.4cm for the control group. For players specializing in the extreme position, the values of the same indicator are lower than the federation model requirements of 4.6cm (experiment group) and 4.4cm (control group) respectively. This requirement is met by the pivots of the experimental group (194cm) and even exceeded by 1.3cm by the same type of players in the control group (195.3cm vs. 194cm imposed by the federation model). Both groups have a very good degree of homogeneity, the coefficient of variability below 10%, fulfilling the requirements for participation in the championship, requiring the presence of at least one player of 199cm or two of 194 cm in the composition of a team.

Regarding body weight, the average of this indicator for the group of the experimental group is 71.53kg and for the control group of 74.30kg. Defenders record lower average values, 67.6kg and 67.4kg respectively, compared to the F.R.B., which is 80kg. For players on the extreme post, the recorded values are inferior to the requirements of the same model - 90kg. Thus, an average of 68.8kg was recorded for the experimental group and 73.8kg, a slightly better average for the control group.

Regarding the requirement of the 100kg specialty federation model for pivoting players, it can be appreciated that both groups are based on athletes approaching the recommended values - the experimental group has a 92kg player and the 96kg control group, which confirms that teams can cope with the game under the panel in the attack and defense phases.

Being in close connection with the height, width of arms is an important indicator for basketball. And at this indicator, the obtained media are inferior to that proposed by the F.R.B. Defender players recorded an average of 181.6 cm in the experimental group and 182.2cm in the control group, with values far (difference of about 11cm) under the requirements of the specialized federation (19 cm), for such a post.

Acknowledgments

I thank all students for participating in this study. No funding was used for this study.

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