RELATIONS AND DEPENDENCIES BETWEEN DIFFERENT ASPECTS OF ADOLESCENT VOLLEYBALL PLAYERS TRAINING

Original scientific paper

Petar Kolev

Department of Sports, University of Sofia "St. Kliment Ohridski"

Abstract

   Volleyball is a sport that has undergone tremendous development in recent years. One of the most specific trends of modern sports' science is the pursuit of scientific provision of sports-technical training. In the period of initial training it is of particular importance to properly structure physical abilities work and improve technical skills, and also to clarify the interrelationships and the power of influence between different stages of volleyball players' run-up. The purpose of this study is to establish and analyze the nature of relationships and the degree of dependence between anthropometric indicators for physical capacity and the level of technical training. The study analyses the technical capabilities and physical capacity of 13 - 15 year old boys. Study sample included 36 athletes, volleyball players from three different volleyball clubs in Bulgaria (born in period January 2000 - December 2001). Obtain results suggest on different relations between anthropometric, motor variables and technical indicators. They suggest directions for improving the training process with young volleyball players.

   Keywords: *volleyball, boys, physical abilities, technical training, correlation interrelations*

INTRODUCTION

Volleyball is a collective sport of competitive nature that does not require complicated equipment – just a ball, a net on two stands and a small playground. This makes it beloved and accessible to many people around the world. It is characterized by great emotionality, complex growth of the individual by setting high demands to his physical, psychological and intellectual potential. It is fast, captivating and the action is explosive. It helps to build and maintain good physical capacity, strengthens and preserves health, solves important social and pedagogical tasks. All this makes it one of the most popular sports in the world (Dimitrov (Димитров), 1984; Beliaev & Savin (Белиаев & Савин, 2000).

Volleyball player training is a complicated, multi-year process that combines solution of complex tasks. Some of them include improvement of training system for high qualified volleyball players, new organizational and methodological forms of adolescent players training, improvement of training and competitive process, change of the selection process for students groups (Kolev (Колев), 2016). Volleyball player training includes a set of techniquesaiming to achieve high sports results on the one hand and the mass practice of the game on the other.

The high level of modern volleyball and the intensified international competition require continuous improvement of the training process, constant search for effective means to raise the level ofyoung volleyball players' training (Mashteriakova (Маштерякова), 1993; Gelezniak (Гелезниак), 1988). It is not possible to have success in the process of training and sports competition without having really high level of training. Contemporary volleyball sets high requirements for the development of different aspects of the athlete's technical, physical, tactical, psychological and theoreticalpreparation.

One of the most characteristic trends in modern sports science is the pursuit of science ground for the athlete'straining. In sports competition high results depend on many factors. Some of them are the individual characteristics of the athlete, the training system effectiveness, material and technical conditions, quality of the training, also geographical and social factors (Platonov (Платонов), 2004; Vertel (Вертел), 2012).

At each stage of many year practice of volleyball players the objectives and tasks set out determine the content of the training system. At the first stage, stage of the initial learning, process is aiming at formation of variety of technical skills, achievement of certain characteristics of important physical qualities, coordination, improvement of functional systems of the body, psychological qualities corresponding to the tasks of the stage. With regard to issues related to playing volleyball, the need for scientifically sound management of the learning process is particularly important, especially when you work with teenage volleyball players. It is necessary to have proper selection of methods, training tools, appropriate control on the workload and physical exercise. All this should be in line with age specifics of child's body growth (Chakarov & Mitev (Чакаров & Митев), 1987). In addition to this we would add that the work efficiency and learning process optimization depend to a large extent on the importance of relationships and the power of inter-state dependencies in adolescent athletes'training.

All the above defines the purpose of this study, namely to establish and analyze the nature of relationships and the degree of dependence between anthropometric indicators for physical capacity and the level of technical training. Based on defined purpose of the study, following two tasks were identified:

- To establish the level of anthropometry, mobility and technical training of the studied players;

- To establish the nature of connections and the degree of dependence between the studied indicators of technical capabilities, physical capacity and their physical development.

METHODS

The object of research is the sport-pedagogical process aimed at improving the capabilities of 13 - 15 year old volleyball players.

The subject of the study are the technical capabilities and physical capacity of 13 - 15 year old boys.

Scope of the survey are 36 athletes practicing volleyball at three different volleyball clubs in Bulgaria (born January 2000 - December 2001)

The research was conducted at the start of the 2014-2015 sporting and competition school year. Players are tested once. They were all tested in totally 20 different variables including morphological variables, motor tests and selected technical elements from volleyball game used as predictors for evaluation of technical capabilities of the included participants.

Obtained results were processed using convenient statistical methods considering the study objectives. Descriptive statistics parameters were calculated to all measured items. Pirson`s coefficient for correlation was used to determine the number of connections and dependencies available

RESULTS AND DISCUSSION

All athletes were measured in 20 variables in total. The indicators for anthropometric measures, physical capacity and technical capabilities are presented in Table 1.

We apply correlation analysis to determine the number of connections and dependencies available, as well as their strength and direction. Pearson's linear correlation (r) for quantifiable linear relationshipsis calculated.

The dependence strength is determined by the absolute value of the correlation coefficient:

Table 1.Anthropometric indicators, physical capacity and technical capabilitiés

No	Indicators	Measuring units	Accuracy in measurement	Direction of Increase
1.	Height	Cm	0,5	+
2.	Weight/body mass	Kg	0,1	+/–
3.	Stretch – height of touch	Cm	0,5	+
4.	Shuttle running 9-3-6-3-9	Sec	0,01	–
5.	Speed 20 м.	Sec	0,01	–
6.	Speed and agility	Sec	0,01	–
7.	Long jump from place	Cm	0,01	+
8.	Vertical leap from place	Cm	1	+
9.	Vertical leap with velocity (vertical flyer)	Cm	1	+
10.	Solid ball throwing	Cm	0,01	+
11.	Flexibility	Cm	1	+
12.	Jumping over and getting through obstacle	Sec	1	+
13.	Pass with two hands above head into target	N	1	+
14.	Pass with two hands above head into target (after physical load)	N	1	+
15.	Pass with two hands from below into target	N	1	+
16.	Pass with two hands from below into target (after physical load)	N	1	+
17.	Pass with two hands above head on gymnastic bench	N	1	–
18.	Pass with two hands from below on gymnastic bench	N	1	–
19.	Front serve above head	N	1	+
20.	Spike into direction of movement	N	1	+

Figure 1. Correlation-structural model of the surveyed indicators

• from 0 to 0.3 - weak dependence;
• from 0.3 to 0.5 - moderate;
• from 0.5 to 0.7 - significant;
• from 0.7 to 0.9 - high;
• over 0.9 - very high.

For 36 studied players only the values above r≥0.33, with a confidence level Pt> 95%, were taken into consideration for the analysis of relationships between the investigated indicators. The links between physical development, motor skills and technical skills of the studied players are tracked.

Clear idea of the significance of relationships between the surveyed indicators is obtained from the correlation-structural model presented in Figure. 1. It shows that the strongest (with greatest significance) is the relationship between indicators 1 and 3 (height and stretch), r = 0.98. There is also great significance between the players' height and their weight, r = 0.77, as well as between their weight and their stretch, r = 0.78. Dependence is also largely observed in the long jump and high leap from place - r = 0.8, as well as between the upper limb explosive force "solid ball throw" and the anthropometric "height and stretch" . In the biggest number of correlational dependencies enters the index "height" - 7.

Significantly strong - in the range from 0.5 to 0.7 - are 11 connections. Positive is the correlation between indicators for shuttle run and speed - r = 0.63, as well as the explosive force of the upperlimbs #10, lower limbs # 8 and # 9 - respectively r = 0, 57 and r = 0.51. Logical is the significant and opposite correlation between the skill ratio "speed and agility" with the indicator for growth and stretch of the volleyball players - r = -0.65, r = -0.68. Opposite in value and as well significant is the relationship between the agility and the explosive force of the lower and upper limbs - r = -0.54, r = -0.53. Significant and reversible in character are the links between indicators 2 and 3 (weight and stretch) and 6 (index of speed and agility).

It is of particular interest to observe the relations of speed indicator (20 m). Out of 8 in total 7 are negative (3 are significant, 4 moderate in strength). Opposite is the relationship between the lower limbs explosive strengths # 8 and # 9 - respectively r = -0.44. Despite the strong influence of the explosive force on the speed characteristics, the achieved result shows that in the studied age group the speed endurance is of higher importance on the achieved speed of movement. We believe this is normal taking into account the high demands that the quality of explosive force applies on the adolescent bone and muscular apparatus and due to the short preparation period since most of the studied players had been involved in volleyball for only one or two years. For proper training and in order to avoidinjuries, the higher achievements inexplosive force are postponed for later periods of the sports' development.

Technical capability indicators get into 23 intercorrelations, most of which are between them. There are not correlations of great significance. Of high significance are just 2 of them - correlations between indicators # 13 and # 14 - r = 0.73 and between #15 and #16 - r = 0.74. The first one is for the two-handed pass above head in target before and after physical load (rotation of the body), and the second is between the pass from below into target techniques under the same conditions.

According obtained results, 18 moderate relationships are found in this study. Theseare the relationships between indicator #4 (shuttle) and indicator #12 (jump over and getting through obstacle)- r = 0.44. The relationship between indicator 10 (upper limb explosive force) and 19 (serve technique) - r = 0.37 and between #11 (flexibility) and #13 (upper feed technique) - r = 0 , 47. Interesting is the relationship obtained in the same range, but with negative sign be-
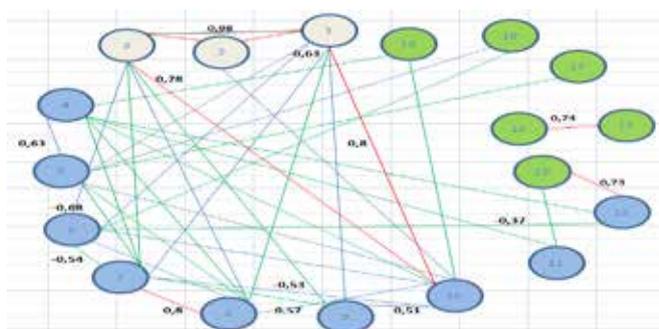
tween indicators 6 (speed and agility) and 12 (jump over and getting through obstacle) - r = -0.37. Both indicators require a certain level of agility. In first oneagility shows in speed of movement combined with handling of volleyball balls, and in the second - by speed of movement in combination with different body positions(in the air and getting through obstacle) This example clearly demonstrates the need for wide range of tools to develop quality of agility and also the above said statementthat there is no transfer of this quality between different types of motor activity (Гелизаков & Дашева (Gelizakov & DAsheva), 2006).

Moderate correlation relationships are detected between indicators 13 and 15 (two-handed pass above head and from below) and 19 (service).

The most interesting in this group remains the highest number of relations between indicator 17 (pass with two hands above head on gymnastic bench) and indicators 13, 14, 15, 16 and 20. All of them are moderate in strength - from 0.33 to 0.5 - and with opposite values. The conclusion from these correlations is that the improvement of one element of the game does not lead to improvement in the development of another technical element. This also confirms that the uniqueness of situations in volleyball requires the elements to be perfected in a constantly changing and complicating environment.

Lack of stronger correlation between indicator 1 (height) and indicator 20 (spike) is also of interest. This means that the technical element spike, characterized by high coordination in this age group, is not yet positively influenced by the height of the players. It is also interesting to note the low significance r <0.33 correlation between the explosive force of lower limbs in indicators 8, 9 and the indicator 20 - the technique of spiking. Correlation with higher significance between these indicators was found in the study of players from elder group (Antonova (Антонова), 2015). In our opinion, the lack of serious dependence between the vertical leap and the effectiveness of the technical element spike in the studied age group is normal from the point of view of short preparation time and the not well used technique of speeding and vertical leap of the players. Thus this observation serves asdirection for increasing the effectiveness of the work for this technical element in the studied age group.

CONCLUSIONS

On the basis of the results obtained and the conducted analysis we summarize the following conclusions and recommendations:

• Despite the strong influence of the explosive force on the speed characteristics, the achieved results in the studied adolescent group show that actually speed endurance is of big significance for the achievement of motion speed;

• Wide range of resources are needed to develop agility. There is no direct transfer of this quality between the various types of motor activity;

• Improving one element of the game does not lead to improvement of another technical element. The uniqueness of volleyball situations requires elements to be improved in constantly changing and complicating environment and settings;

• In the surveyed age group the characterized by high coordination complexity element of spike is still not positively influenced by the players' height;

• Development of motor skills and the improvement of the technique of volleyball game should be done in unity and interrelation;

• Purposefully to work on development of quality of agility by using more and more diverse means;

• Enhancement of the game elements is subject to constant change in conditions and environment.

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Correspondence:
Petar Kolev
Department of Sports, "Sports games and Mountain sports"
University of Sofia "St. Kliment Ohridski"
15 Tsar Osvoboditel Blvd, Sofia, Bulgaria
E-mail: kolev.pepi@gmail.com
Mobile: +359 884083287