

The Ways to Improve the Technical and Physical Training of 17-18-Year-Old Volleyball Players by Means of Weight Training Exercises

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Abstract:

The ever-increasing sport competition is one of the modern tendencies of sport volleyball. Competitions of volleyball teams are becoming more and more prolonged and intense. The development of physical and technical preparedness indicators is one of the most significant factors contributing to the success of a volleyball player's competitive activity. Therefore, the high level of achievements in modern sport necessitates the constant improvement of all aspects of a sportsman's training. The article considers *the problem* of improving the technical and physical training of 17-18-year-old volleyball players by means of weight training exercises. *The purpose* of the study is to analyze the feasibility of using weight training exercises in the process of improving the technical and physical training of 17-18-year-old volleyball players. *As approach*, 20 beginner volleyball players took part in studies. *The results* at the end of the experiment showed an accelerated increase in the indicators of technical preparedness among the volleyball players of the experimental group. *In conclusion*, thus, the practical use of the proposed technique with the use of weights in the training of young volleyball players has shown its high efficiency in the joint solution of problems of technical and physical training. This is expressed in obvious changes in technical indicators that characterize the gaming technique and occur due to the introduction of special equipment with weights into the training of volleyball players.

Keywords: physical preparedness, technical preparedness, volleyball, weight training exercises.

INTRODUCTION

Volleyball is an interesting and exciting sport game. Most youth play this game and, certainly, many of them are striving to become successful in sport. But, in order to show skills in this game, it is necessary to receive long-term training. Training begins with the first steps of a player in volleyball. It is clear that mastery is not acquired at first classes. To solve this problem as quickly as possible is a matter of great concern to a player and his/her coach.

Along with the performance of tasks of health strengthening, all-round physical training, improving vital motor skills, the correctly chosen volleyball training method contributes to the education of "volleyball" talents among students, as well as creates the prerequisites for mass involvement of people of different sexes and ages in being regularly engaged in this sport during their lifetime.

Analyzing foreign literary sources and works of volleyball specialists [1-4], it should be noted that over the past decade this sport game has undergone significant changes related both to its natural process and to changes in the rules. Despite a significant amount of research in volleyball, many aspects of this sport game remain unrevealed and are to be improved.

Modern scientific evidence indicates that the effectiveness of the volleyball training process can be achieved only when all types of training are taken into account [5]. But physical training is basic and for this reason it should be organized with due account of individual peculiarities of the young organism, the development and the use of technical means of control in the training process.

Despite the considerable success of the theory and methodology of volleyball, at present all possible reserves for training volleyball players of mass categories have not been exhausted. The improvement of the technique of technical and physical training of sportsmen is one of such reserves [6]. In our opinion, the problem of comprehensive improvement of the technical and physical training of young volleyball players is the most important in improving the quality of the training process.

The training of volleyball players was studied by many foreign and national specialists: the analysis of a volleyball player's skills necessary for victory [7], the development of the standardized assessment of the skills of young volleyball players

[8], an impact of special training on jumping [9]), the use of intensive and active training techniques [10], the development of special endurance [11], teaching serving and striking skills [12], the analysis of conditions for motor training of young volleyball players [13], the formation of special dexterity [14], the development of accuracy of movements [15], the improvement of technical skills [16].

Thus, research of the problem of physical and technical training of volleyball players is rather common, but the problem of comprehensive improvement of the training process along with the individual improvement of physical and technical training of volleyball players has not been studied enough. Scientific research was mainly aimed at studying only certain aspects of physical preparedness.

MATERIALS AND METHODS

The purpose of the study is to analyze the feasibility of using weight training exercises in the process of improving the technical and physical training of 17-18-year-old volleyball players.

The pedagogical observation of training and competitive activities, questioning of coaches, sport testing, a formative experiment, methods of mathematical statistics were used as research methods.

At the first stage of the study, a method of observation of the level of technical and physical preparedness of volleyball players was used. The observation was conducted during the volleyball universiade among higher education institutions, in which the experimental group took part. The method of pedagogical observation was used to identify and compare the weaknesses and strengths of volleyball players' training with the aim of introducing the proposed methodology to improve the weaknesses of training.

The observation protocol was divided into two parts, corresponding to observations of the actions both in attack and defense. In some columns of the protocol, the main methods of the game were recorded. During the game, performance indicators were recorded, the assessment of which was determined in conditional positive "+" and negative "-" points, respectively, successful attempts were marked as "+" and unsuccessful ones –

as "-". Then the number of successful attempts was converted into percentages.

In addition, the method of questioning of volleyball coaches was used to determine the problems of improving the training process with amateur volleyball players.

At the second stage of the study, the method of testing of technical and physical preparedness and a formative experiment were used to determine the ways to improve the technical and physical training of volleyball players.

The aim of the formative experiment was to apply the developed methodology for improving the technical and physical capabilities of volleyball players and to test its effectiveness.

20 beginner volleyball players participated in the experiment.

RESULTS

Based on the results of the observation, the following results were obtained:

actions in attack:

- the effectiveness of the team's serves was 9.8%, which indicated a small number of successful attempts;

- overhead passes were effective by 20.6%; this result indicated that most of the passes were inaccurate and untimely;

- spikes were assessed at 41%, the team made a lot of mistakes, there were more unsuccessful attempts than successful ones; the actions near the net were even less effective (18.6%);

actions in defense:

- ball catches were effective by 33.8%, this indicated the unpreparedness of volleyball players in the speed of reaction to events during the game, the untimely response to the flying ball;

- lower passes were unsuccessful, inaccurate, untimely and assessed at 40%;

- the implementation of blocking actions was assessed at 43.6%; we noticed the lack of blocking technique, untimely and inaccurate actions in volleyball players;

- the actions near the net were also passive; the lack of mutual assistance and activity in the movement allowed assessing the training of volleyball players only at 22%.

Thus, after reviewing and comparing the results of the protocol of observation of actions in both defense and attack, the following conclusions can be drawn: according to the protocol, the training of volleyball players in defense is higher than in attack; therefore, the actions in attack need to be paid more attention in the process of improving the technique in training.

In this regard, a complex of experimental methods was aimed at developing the strength of muscles of hands, upper shoulder girdle, back and legs, which, in our opinion, could influence the results of technical training in performing such game elements as blocking, serving and spikes.

Based on the results of questioning of volleyball coaches, the following results were obtained:

- the interviewed coaches turned out to be experienced specialists with work experience of 6-16 years;

- the majority of the respondents-coaches (64.7%) preferred a differential training method, only a few of them applied circular and group training methods;

- the processing of the results of the answers to questions of the effectiveness of using weights in the training process showed the following: 100% of respondents agreed with the opinion that the use of weights in training was effective. But 25% of them believed that weights increased general and special preparedness; 65% took the view that weights helped increase the strength of the muscles of the upper shoulder girdle and lower limbs;

- all respondents agreed with the opinion that weights were advisable to be used at the age of 14-15 and 17-18, depending on the load intensity;

- the respondents expressed their opinion quite clearly about improving the training process with the use of weights. Part of the coaches (25%) said that the use of weights increased the load on a group of muscles, which ensured an increase in the level of physical preparedness of volleyball players in the future; 45% of respondents said that the use of weights increased the intensity of training.

- each of the coaches expressed his opinion on improving the training process. The respondents indicated the following ways to increase the effectiveness of the training process in modern conditions: 35% believed that the psychological mood and systematic training sessions improved the training process; 27% shared the opinion on the importance of systematic and disciplined training sessions, the use of innovations and training machines;

- the answers to the question about the effectiveness of the use of a circular training method in the improvement of physical and technical training proved to be surprising: 23.7% of respondents assured that the circular method was effective only in improving the physical training; on the contrary, 59.2% of respondents said that this training method was most effective in improving these types of training.

The duration of the subsequent experimental study was 145 days along with the comprehensive conduct of all training sessions; the duration of the formative experiment to determine the ways to improve the technical and physical training of beginner volleyball players was 75 days in compliance with all the requirements for the equality of research conditions.

Previously, according to the results of preliminary testing, two groups were formed: an experimental group (EG) – 10 people, and a control group (CG) – 10 people, the level of physical and technical preparedness of whom was at the same level.

Training sessions in the experimental group were carried out according to the proposed method, as the second part of the basic training (a set of weight training exercises on a circular system), while in the control group training sessions were conducted with the use of the same set of exercises, but without weights. Tools of physical and technical training were selected with due account of age, individual, functional capabilities of the organism of each volleyball player, as well as the characteristics of the sport.

The effectiveness of the proposed methodology for improving the technical and physical training was assessed through the comparison of the results of intragroup changes in the level of preparedness of both groups. Dynamic shifts were compared by the difference in the results of the experimental and control groups in technical and physical preparedness at the beginning and at the end of the formative experiment.

Indicators of physical preparedness of 17-18-year-old volleyball players at the end of the formative pedagogical experiment are presented in Table 1.

The data in Table 1 indicated that as a result of repeated testing for physical preparedness, significant differences were recorded in both groups, namely: the results of the control group in the shuttle run significantly exceeded the results of the experimental group by 18% ($t=2.5$, $p<0.05$). The results of running jumps were higher by 14% ($t=2.5$, $p<0.05$) and this also indicated the obvious progress.

In turn, the experimental group was superior to the control group in the following tests: results of arm flexion and extension to support for 10 seconds were higher by 23% ($t=7.3$, $p<0.001$), trunk extension for 10 seconds – by 24% ($t=8.6$; $p<0.001$). Significant changes occurred in squats for 20 seconds – by 19% ($t=2.1$, $p<0.05$).

Table 1. Indicators of physical preparedness of 17-18-year-old volleyball players at the end of the formative pedagogical experiment (M ± m)

	Tests					
	Shuttle run, 4 × 6, sec	Squats for 20 sec, number of times	Arm flexion and extension for 10 sec, number of times	Trunk extension for 10 sec, number of times	High jumping	
					Standing high jump, cm	Running jump, cm
EG (n=10)	18.95±0.2	23±0.5	19±0.4	18.5±0.3	44.8±4.2	49.7±4.5
CG (n=10)	15.96±0.3	16.1±0.9	15.5±0.3	15.3±0.5	44.7±1.8	53.7±2.1

Table 2. Indicators of technical preparedness of 17-18-year-old volleyball players at the end of the formative pedagogical experiment

	Tests				
	Ball serving in zones 1,6,5, 3 attempts	Overhead pass (10 times)	Lower wall pass (10 times)	Spikes	
				To zone 4, 3 attempts	To zone 6, 3 attempts
EG (n=10)	2.3±0.2	8.7±0.3	8.5±0.3	1.3±0.2	2.6±0.2
CG (n=10)	1.7±0.1	7.6±0.5	6.9±0.2	0.8±0.1	1.9±0.1

Research results indicate that the proposed methodology of improving the physical preparedness in volleyball training sessions is more optimal not in absolute indicators of growth of physical qualities, but in terms of the influence on the dynamics of technical preparedness that is dominant at the initial stage of training.

Indicators of technical preparedness of 17-18-year-old volleyball players at the end of the formative pedagogical experiment are presented in Table 2.

The data in Table 2 showed that as a result of the repeated testing for technical preparedness, the differences in technical preparedness indicators in the experimental group were more significant for such tests as serving to zones 1, 5, 6 ($t=3.3$, $p<0.01$), overhead pass ($t=8$; $p<0.001$), spikes to zone 4 ($t=3.5$, $p<0.01$). The differences in lower wall passes were the most significant ($t=7.8$, $p<0.001$).

DISCUSSION

Based on research findings, the following can be noted: according to the results of the technical preparedness of the experimental group, the proposed set of weight training exercises for improving the technical training on the circular system is considered to be the most optimal. Thus, as for the integrity of the training process, less significant increases in physical preparedness indicators seem more appropriate, since they do not restrain the accelerated increase in technical preparedness indicators among volleyball players in the experimental group.

The received data show that after the period of using weight training exercises, the indicators of technical preparedness of the volleyball players of the experimental group have significantly improved, in contrast to the indicators of physical preparedness. This indicates that in this case physical qualities have a slight effect on the level of technical preparedness of beginner volleyball players. Therefore, it should be noted that the practical use of the proposed methodology for improving the physical and technical training in training sessions with young volleyball players can give positive changes in improving technical preparedness.

CONCLUSIONS

1. The analysis of literary sources and the study of practical experience of volleyball coaches show the lack of scientifically grounded methodology of the training of young volleyball players by using weights when teaching the game technique and improving physical training with the use of the circular training method.

2. Based on the results of pedagogical observation, basic characteristics of technical and physical preparedness of volleyball players have been revealed and substantiated, in accordance with which it is possible to create model characteristics of the training of young volleyball players of mass categories.

3. The practical use of the proposed methodology with the use of weight training exercises in the training of young volleyball players showed its high efficiency in the joint solution of tasks of technical and physical training. This is expressed in obvious changes in technical indicators that characterize the gaming technique and occur due to the introduction of special weight training exercises into the training of volleyball players.

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