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Research on the Development of Coordination Ability and Training Methods of Junior Volleyball Players

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Abstract: This paper focuses on the development of coordination ability of junior volleyball players, and discusses the key role of coordination ability in volleyball training by combining technical means and feedback mechanisms. This paper systematically analyzes the age characteristics, classification methods and relationship between coordination and the sensitive period, and points out that this age group is a critical period for the formation of strong nervous system plasticity and motor skills. On this basis, diversified teaching methods including general preparation exercises, special coordination tasks, and circular training are proposed, emphasizing the systematic, adaptable and individualized training content. The study believes that the scientific and rational use of the sensitive period, combined with modern training methods, can significantly improve the coordination, reaction speed and sports adaptability of young athletes, and lay a solid foundation for their long-term development.

Keywords: Coordination Ability; Volleyball Players; Sensitive Period; Training Method

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1.The main manifestations of the athletic ability of volleyball players

1.1 The relationship between age and coordination ability

The modern volleyball system aims to create a training method that contributes to the education of high-level athletes. The main focus is on developing innovative strategies to organize and systematize player development, thereby ensuring stable and long-term improvement in player performance. The strategy is based on a rethinking of traditional methods, emphasizing personalized coaching and employing modern methods to evaluate and correct movements.

One aspect of the training is age staging, which covers developmental stages from 4 to 17 years old. During this period, coordination skills underwent significant changes, which became the basis for the successful development of volleyball technology. The problem of diagnosing these abilities is closely related to the study of their formation of natural laws, and there are different views on this problem in the scientific community [15].

For example, M.M. Bezrukich noted that in children aged 6 to 9 years, visual control plays a leading role in controlling movements. It was during this period that children underwent an important transformation: children began to not only succumb to intuition and observational control, but also relied on preset motor programs that significantly reduced the time of movement cycles by increasing speed and accuracy. During the 6-8 year gap, there is a significant age-related jump in coordination function, when motor areas of the cerebral cortex are actively formed. At the same time, the functional values of

the frontal lobe and the junction region change, affecting the body's ability to control activation and coordination processes [4]. Research by V.K. Balsevich and colleagues showed that training in children of about 4 years helps the basic components of coordination, especially those related to reaction speed, develop most quickly. As children grow up at the age of 5, the characteristics of time and strength develop better, and by the age of 6, the socio-temporal skills improve significantly. These data indicate the existence of the so-called sensitive period, i.e. the body is particularly susceptible to certain motor activities [3].

Analysis of age characteristics showed that the peak sensitivity of coordination development occurred in primary school age and the first half of adolescence. Thus, the intensity of the development of certain functions increases almost fivefold in girls aged 8-9 years, and in the period from 9 to 10 years this figure is about 3.2 times that of 13-14 years old. Dynamic balance is especially active between the ages of 7 and 10, which is an important factor in the training of volleyball players. In addition, from 4 to 16 years old, the ability to accurately distribute forces in space has increased by more than five times. The results of the standing long jump test showed that the best accuracy of the movement occurred at two key age stages - early childhood (4-6 years old) and high school threshold (9-10 years old). Interestingly, the number of sensitive periods during adolescence (11 to 14 years old) decreases significantly – at least by half. However, by the age of 14-15, the indicators of girls return almost to the level typical for 9-11 years. Boys, especially in secondary school, have significant biodevelopmental potential despite a temporary decline in symptoms at the age of 12 to 13, which correlates with the active formation of speed and strength [14].

The time frame for the formation of coordination in children's individual development cannot be considered to be a universal biological law. When the same characteristics are assessed using the same methodology, different researchers draw ambiguous conclusions about sensitive developmental periods. Such diverse explanations stem from individual differences in children's biological growth and development rates. For example, girls with average physical development indicators reach the peak of coordination at about 12 years of age. At the same time, the improvement in coordination is similar in all girls compared to the level of eight-year-olds, regardless of their biological developmental peculiarities.

Boys with average physical development have two pronounced periods of agile growth – one at 8-9 years old and the other at 11-12 years old. These observations suggest that favorable biological conditions for the formation of coordination are manifested in early childhood and adolescence, while these stabilization processes occur in high school.

L.V. Volkov described in detail in his work the dynamics of the development of coordinated nature. He noted that during the formation process, there are three periods of significant growth in these abilities: 8-9 years, 11-12 years, and finally 14-15 years. Volkov also distinguishes three main categories of coordination and associates them with specific age-sensitive periods. Thus, spatial orientation begins to develop as early as 5-6 years of age, sensitivity peaks between 7 and 10 years of age, stabilizes at 10-12 years of age, decreases slightly during adolescence (14-15 years), and compares with adult indicators at 16-17 years of age. Particular attention is paid to the ability to distinguish the rhythm of movements, which begins to form around the age of 7-8 years. At the same time, children aged 5 to 10 years are at the lowest stage of development in terms of muscle effort distribution capacity, suggesting that further correction and formation are needed in subsequent growth stages [7].

Figure 1: Age and coordination development table

Age group	Main development characteristics	Influencing factors
4-6 years old	Visual control, basic coordination	Nervous system development, sports experience
6-8 years old	Presets of exercise programs to speed up the action cycle	Behavioral observation, reaction speed
8-9 years old	Dynamic balance and spatial positioning capabilities are significantly enhanced	Physiological changes, sensitive periods
11-12 years old	Stable coordination, jump strength and speed	Hormonal changes, psychological maturity
14-15 years old	Highlight coordination and gradually mature skills	Biological development and training accumulation

1.2 Classification of coordination ability

The joint research of L.V. Volkov and colleagues allowed us to consider coordination as a multifaceted manifestation of

motor activity. First of all, they include high precision and coherence of movements, reaction speed, flexibility, as well as a developed sense of rhythm and rhythm. It is also important to be able to tense and relax muscles in a timely and correct manner, which allows the body to adapt to the changing environment and adjust the movements to the situation.

Other authors have proposed another classification of coordination ability. They fall into three main categories: The first covers the ability to accurately measure and regulate spatial, temporal, and dynamic parameters of motion. Skills such as "sense of space", "sense of balance", "sense of timing" and "sense of muscle" fall into this category ; The second category embodies the ability to maintain balance – whether in a stationary position (maintaining a stable posture) or in dynamic conditions such as skating, skiing, or handstands ; The third category includes skills that allow you to perform motor movements without excessive tension and stiffness, which is essential for the effective and smooth execution of movements [15].

V.A. Romanenko proposed to examine coordination from multiple perspectives, dividing it into the following categories: the ability to form motor programs, the ability to maintain balance, and motion control considering spatial dynamics and spatiotemporal characteristics [17]. This method allows you to fully assess the body's ability to not only perform certain actions, but also adapt to changing environmental conditions.

Subsequently, V.M. Naskalov proposed his own classification, distinguishing the following categories of coordination abilities:

Spatial and visual orientation is determined by the amount and accuracy of perception and the processing of spatial information received from the environment.

Reactivity – characterized by the speed of nerve impulse conduction and the speed at which the optimal solution is found under the selection conditions.

Rhythmic ability is manifested by the coherence of continuous dynamic changes in excitation and inhibition in the nervous system, as well as the harmonious interaction of various nerve centers.

Balance skills – involves using vestibular information effectively to program and correct movements.

Intermuscular coordination reflects the rational and economic interaction of various muscle groups in the process of performing specific actions.

Exercise program restructuring – demonstrating rapid adaptation, stopping the implementation of established plans, and switching to new protocols in response to environmental changes [16].

In the context of volleyball, many coordination skills are given special importance. Among them, the ability to respond quickly, differentiate motion parameters, orient spatial and establish connections between various moving elements is particularly prominent [9]. These qualities help athletes adapt to rapid changes in the pace of the game, respond quickly to opponents' movements, and maintain a high level of performance accuracy.

Research by A. Schnabel and V. Starosta [21]. Focus on the methodological importance of technology and coordinated interaction. The authors recommend putting coordinated training in the first place, developing tasks, selecting methods and methods based on the athlete's multi-year stage of progress. This approach allows you to take into account the characteristics of individual development, thereby enhancing the effectiveness of the training process.

Several studies conducted by V. Rathod and V. Rai [19], demonstrating the importance of considering age characteristics in the formation of various motor coordination. This approach mirrors Bernstein's principles, emphasizing the need to synchronize educational influences with the biological characteristics of human development. At different stages of ontogeny, the results of training may vary: at some stages, emphasis on the development of motor skills gives the best results, while at others, the effect is less pronounced. Only a detailed analysis of age characteristics and adjustment of training loads will maximize the potential of each athlete.

1.3 The relationship between the sensitive period and the training effect

It is important to use the concept of "sensitive period" when planning the training process, based on age-related data on athletic performance development. Research in this area distinguishes between stages characterized by active growth, subsequent stabilization, and slowed developmental rates. Interestingly, the sensitive period covers not only motor abilities, but also intellectual, musical, and mathematical abilities. In this context, V. Lyakh and collaborators proposed a scale that

assesses the development of motor competence, conditionally dividing it into three levels. According to their findings, if the mass growth rate exceeds 3%, it indicates the entry into a sensitive period, and it is recommended to devote up to 30% of training time to the development of this trait. For the nature of the average growth rate (about 2%), the best option is to spend 20% of the time and at a lower rate – only 10% [18].

The researchers' observations show that the development pattern of coordination is heterochronic, that is, the development is uneven across different age groups. Of particular importance is the comparative analysis of children and young athletes who are not involved in sports [10]. This comparative approach not only assesses the impact of targeted training on coordinated development, but also provides valuable data to establish effective long-term training programs for children and adolescent sports schools.

J.Szymonek and his co-authors emphasize the importance of careful planning and personalized selection of training loads, taking into account the potential capabilities of each young volleyball player. They argue that the success of purposefully developing movement traits directly depends on the period in which these traits show the greatest growth. The researchers point out that when training focused on the development of coordination competencies coincides with periods of intense growth associated with age, there is a so-called "maximum rate of progress". Conversely, at the stage where the growth rate is below maximum or moderate, the improvement in coordination skills is less obvious [20].

V. Liach and Z. Witkovsky [18] argues that the concept of a sensitive period is controversial among experts. There are various opinions on whether the training effect is always obtained during periods of accelerated development of certain motor skills. However, the methodological principles that require taking into account the individual characteristics and developmental details of each athlete are still generally recognized. An important aspect is to focus efforts on improving the functioning of the so-called "proximal developmental zone", rather than trying to influence the already fully formed motor skills.

As noted by V.Y. Mayakina, although sensitive periods are important, simply considering these periods is not enough to effectively help young athletes [15].The authors make a strong argument that continuous diversification of training methods throughout developmental stages is a key condition for the formation of stable motor memory. This strategy allows the body to quickly rebuild the exercise routine and learn new motor skills. Considering the complexity and variability of loads, the planning and standardization of coordinated training is still a hot issue that urgently needs scientific basis and practical improvement.

If we talk about coordination, it can be described as the body's ability to accurately and continuously execute motor instructions from the cerebral cortex [2]. Scientists have found that certain age groups are more sensitive to various external and internal influences [3]. It is during these moments that the development of specific functions is most remarkable, providing a wide range of opportunities for purposeful work by experienced teachers and coaches. Therefore, if these windows of opportunity are used correctly, volleyball coaches have every chance of significantly improving the coordination skills of children in primary school age.

Figure 2: Relationship between sensitive period and training effect

Sensitive period	Recommended training time ratio	Training type
4-6 years old	30%	Motor skills and sensitivity training
7-9 years old	30%	Coordination ability, reaction speed training
10-12 years old	20%	Technical improvement, tactical awareness
14-15 years old	10%	Fine skills and psychological quality improvement

Teaching experts concluded that the optimal age range for establishing a foundation for coordination is 7 to 12 years [2]. During this period, not only physically, but also psychologically, children have the highest acceptance of learning, which lays a solid foundation for further motor growth. As the training burden increases, children gradually accumulate physical condition while activating various resources of the brain and the whole body [6]. This cumulative effect helps uncover potential and adapt to new environments.

In the context of volleyball, those physical qualities that contribute to the development of coordination are of particular

value. These include the suddenness of the impulsiveness of action, race endurance, the ability to jump and control falls, and a variety of gaming techniques. All this suggests that the basis of high coordination lies in the adaptability of the nervous system and the body as a whole. It is especially important to note that at the age of 7-9 years, fetal plasticity is formed, which allows the baby to effectively adapt to external influences, opening up opportunities for further improvement.

In conclusion, it can be said that modern methods of studying sports coordination encompass a wide range of features - from the basic skills that form motor programs to the complex adaptation mechanisms that enable athletes to successfully cope with environmental changes. A comprehensive understanding of these processes based on interdisciplinary research and age profiling analysis is key to building an effective training system and promoting the optimal development of young athletes' physical fitness. The formulation of individual training programs should take into account age characteristics and developmental stages, as well as the specific requirements of volleyball coordination ability. The integration of the concept of sensitive periods, the principle of load individualization, and a variety of methodological techniques have laid a solid foundation for young athletes to successfully develop sports skills. This interdisciplinary approach not only maximizes each child's biological potential but also sets the stage for his future athletic achievements.

2.Teaching methods and methods for developing the coordination skills of junior volleyball players in the education and training phase

2.1 The importance of cultivating coordination

Coordination development in young volleyball players is carried out through long, age-appropriate training, in which all aspects of sports activities are improved. Key elements of the process include: Improving the body's motor function. The gradual development of motor skills contributes to more accurate performance of movements, which directly affects the success rate of physical activity; Accuracy in the execution of actions is obtained. Regular training helps develop the ability to complete exercises with high accuracy and coordination; General health promotion. Physical activity aimed at developing coordination has a positive effect on the immune system and the overall condition of the body; The formation of self-discipline. The training process fosters a sense of responsibility, perseverance, and self-organization in athletes, which is important not only in sports but also in everyday life [5].

Through professional planning and training methods, volleyball has high potential. During training, gradual microevolution of physical fitness was observed: improvements in muscles, ligaments, and vestibular apparatus contributed to the overall coordination and adaptability of children [4]. The main goal of coordination skills development is to optimize the sports training of volleyball players and prepare them for future sports achievements. This means the ability to apply the learned skills in conditions of increased loads, both in training and in competitions.

A.N. Anaprienko noted the general tasks that coaches and teachers face in coordination work:

The system develops new motion elements. It is important to constantly introduce universal and special preparatory coordination exercises to promote diversity in movement patterns.

Improvement and adaptation of movements. Practicing skills in various conditions is necessary, which allows volleyball players to confidently respond to changes in the game.

Comprehensive training, including the performance of complex technical elements and active tactical interaction, demands a high level of physical fitness. In the tense pace of the game, especially under force pressure, athletes must make quick decisions, adjust tactics, and maintain high intensity until the final seconds of possession. [1].

An equally important aspect of an athlete's development is an innate physical trait due to genetic predisposition. These basic features are formed based on the activation of morphofunctional processes, ensuring maximum performance of physical activity when performing purposeful motor tasks. I.V. Avramov's physical qualities include flexibility, endurance, strength, speed, and of course, coordination, which are the main physical qualities [2].

Coordination depends not only on physical factors, but also on neuromodulation of movements. For volleyball players, such an element as stability balance is very important - the ability to maintain a stable posture under dynamic and static loads; Site orientation – the ability to correctly perceive and analyze spatial information, which is essential for timely decision-making; Differentiation of exercise parameters – the ability to quickly adapt and reconstruct the exercise program according to the

competition situation. These factors manifest themselves in a variety of speeds: from the speed of analysis of the situation to the rapid adoption of management decisions, which in turn affect the speed of action and the effectiveness of the execution of technical techniques. According to N.V. Egrashkin, the speed and agility of a volleyball player are determined by all these factors together, since they are an important part of almost all movements in the game [10].

A.P. Kolomiets emphasizes that the development of coordination is directly related to the symmetry of movements. Particular attention is paid to the even distribution of left and right hand strength, which is especially important when performing up and down catches and passes [12]. Over time and as motor skills improve, muscle sensation can develop subtle differences, improving the accuracy and economy of movements.

S.P. Galbtsov noted that the performance of coordination depends on a number of factors, including the ability to accurately analyze movements, the work of the analyst (especially a sports analyst), the complexity of the task performed, the more complex the task, the higher the coordination requirements, the level of development of other physical qualities, speed characteristics, dynamic strength, flexibility and other factors affect the overall effect of the action, the nature of personal qualities, such as courage and determination. The age of the athlete plays an important role in the acceptance of learning and adaptation to the load. Overall preparation is equally important, including having a diverse and varied athletic skill, which is key to a successful sports career [7].

The development of coordination in volleyball players is a process in which their control of their movements improves and they develop the ability to adapt quickly to changing conditions of the game. This includes not only the precise execution of movements, but also the ability to reconstruct motor activity in real time and confidently control one's body in an unsupported position. Any exercise that meets at least one of these criteria can be classified as coordination.

2.2 Systematic principles and practice classification of coordination training

Systematic coordination means using a common set of preparatory exercises that are diverse and adaptable. There are many factors to consider when choosing and planning such events. First of all, these periods are the time allotted for coordinating work in order to avoid disrupting the balance of extracurricular activities, extracurricular activities or other physical activities within the framework of independent training. In addition, the age, gender and individual characteristics of the student should be considered. For example, at school age, boys are often offered exercises such as kettlebells, dumbbells, or barbells, while girls are characterized by using hula hoops, sticks, ribbons, ropes, and balls. We should not neglect material and technical support: the availability of equipment and inventory also plays an important role in the organization of the course [6].

Researchers generally divide general preparatory coordination exercises into four broad categories. The first category includes exercises aimed at developing basic life skills. Here we are talking about the introduction of new movements or variants of known exercises recommended for students in grades 1 to 5 in the school curriculum. The second category covers exercises that promote the expansion of the exercise experience by performing a variety of general preparatory tasks. These exercises can be performed with a variety of objects – sticks, jump ropes, balls or sticks – as well as in solo or double performances, while the performance conditions can change: change body position, direction of movement and other parameters.

The third group includes general developmental exercises, which include physical and acrobatic elements, as well as running and jumping exercises. The focus here is on the development of endurance, strength and speed. The fourth group of exercises focuses on the psychophysiological functions of the body. These tasks help to form a sense of space and time, while helping to accurately regulate muscle effort and develop motor memory and intentional responses—that is, muscle impulses generated when a person mentally imagines an action [6].

The variety of methods for developing coordination skills is also worth paying attention to. Among them, there are some strictly controlled exercise methods, which can be classified according to several characteristics. On the one hand, a distinction can be made according to the degree of selectivity of the influence: exercises that intentionally affect homogeneous coordination skills can be distinguished from broader exercises that affect a set of motor skills. On the other hand, depending on the nature of the task, the exercises are divided into standard repetition and variable, the latter implying variability in performance conditions that help coordinate the more flexible development of skills.

V.G. Bubenshikova emphasized that the effective development of coordination skills requires the use of physical exercises

that meet a number of specific requirements. First, this type of exercise should be associated with overcoming coordination difficulties, which stimulates the body's adaptive response. Secondly, a volleyball player needs to perform complex motor movements with high accuracy and speed, which allows him to rationally use his physical abilities. Third, the innovation and originality of the task are very important, which can change the regular course of the action or the conditions for its execution, and create new developmental stimuli [6].

According to S.P. Garbuzov, the key tool for developing coordination in volleyball players is physical exercises, which have a high degree of coordination complexity and contain novel elements [8]. It is these exercises that stimulate the neuromuscular system, aiding in the quick and accurate implementation of complex exercise regimens, which is especially important in a dynamic competition environment.

With a variety of methodological approaches, the complexity of the exercises can be significantly increased. Among them, the following methods can be distinguished. Modification of spatial, temporal and dynamic parameters. By changing the trajectory of movements, the speed of execution, and the cadence of movements, coaches create additional stimuli for the adaptation of the athlete's coordinated responses. Adjustment of external conditions. Using non-standard arrangements of shells, changing their weight and height, it is possible to introduce unexpected elements, which require volleyball players to quickly reorganize the locomotor system. Change the support area. Using unstable surfaces or movable platforms in balance training forces athletes to actively activate stabilizing muscles and improve body control. A combination of multiple motor skills. The combination of walking, jumping, and running with the use of balls or other objects creates a diverse range of movements that promote complex adaptations of motor skills. Introduce elements that respond to signals. Completing a series of exercises on command or in a limited amount of time not only develops coordination, but also improves reaction speed, which is extremely important for tactical games. This approach makes it possible to incorporate coordination exercises into the training process, especially when volleyball has specific technical and tactical requirements [8].

When performing volleyball training, it is recommended to use two main types of coordinated training methods. The first category includes leadership exercises aimed at actively developing new forms of action. These exercises help athletes become familiar with multiple movement modes, which is important early in training. The second group includes developmental exercises specifically for basic coordination skills in volleyball. For example, completing special tasks in difficult conditions, such as catching the ball while jumping on the bench and passing it to a partner, or rolling continuously on the mat and passing the ball over the net after receiving the ball, can help develop adaptability in close to playing conditions.

Figure 3: Coordination training exercise classification table

Practice categories	description	target
Basic life skills exercises	Introducing new movements and variations of known exercises	Helps athletes master basic sports skills
Universal preparation tasks	Perform multiple tasks, apply different objects and vary performance conditions	Expand the sports experience
General developmental exercises	Contains elements of endurance, strength, and speed	Improve physical fitness
Psychophysiological function exercises	Develop a sense of space, time, motor memory and intentional response	Enhance muscle regulation and responsiveness

3.The main teaching methods for developing coordination ability

3.1 Basic coordination exercises

An essential component of comprehensive training for volleyball players is a skillful warm-up, which is essential for the development of coordination. Before performing the main movements, the trainer must make sure to include a specially selected set of physical tasks that will help prepare the body for the upcoming load. This warm-up helps activate plant functions, improve overall performance, and optimize the state of the muscular system, thereby maximizing the performance efficiency of complex exercise regimens.[8].

During running or walking training, special attention is paid to coordination with the ball, which not only helps to master passing skills, but also develops coordination of movements in dynamic sports conditions.

Pass the ball forward. During the running movement, the athlete must confidently pass the ball strictly forward, ensuring that the arm remains straight and the movements are coordinated throughout the movement.

Flick the ball forward with your clapping hands. The exercise consists of simultaneously clapping forward to throw the ball to high ground, while the ability to catch the ball accurately and without delay is also important.

Throw the ball behind your back. Here, the athlete needs to throw the ball over his back and successfully catch it, which contributes to the development of spatial perception and motor flexibility.

Pass the ball over the net. This exercise is designed to practice the skill of hitting the ball out of the goal instead of touching the net, which requires precision and synchronization of movements. In this exercise, the ball is thrown up and then slapped on the back or chest to catch the ball without falling.

Possession of the ball behind the scenes. This movement involves dribbling the ball from behind, forward and up, and throwing it over the head, then catching it and passing it to a partner, which helps develop the ability to coordinate movements in non-standard positions.

A dynamic combination of throwing and squat. At this point, the ball is thrown to the high ground, and then the athlete touches the ground with both hands to perform a squat, catch the ball, and keep it in the hand, which helps improve reaction and synchronization of movements.

3.2 Comprehensive and coordinated training

To foster teamwork and coordination, it is important to practice in pairs, including the following options:

Passing the ball between players. It is a classic exercise in which one athlete passes the ball to another athlete by testing the accuracy and speed of the pass.

Change the bounce height. Here the ball bounces at different heights and then passes to the partner, which requires adapting to changing circumstances.

Possession of the ball in your territory. Exercises based on the connecting ladder technique help improve ball control in tight spaces.

Pass the ball with a squat movement. When passing, the athlete must do squats, which increases the element of physical activity and improves coordination when changing body positions.

Passed to the wall. In this exercise, the ball is passed at a specific location on the wall, helping to develop a sense of spatial direction and throwing accuracy.

Elements of dance steps. Balls with elements of dance movements on the field contribute to the development of shaping abilities and multiple motor skills.

In addition, pair exercises should provide for the option of passing the ball by bending the body in different directions (forward, sideways, backward), as well as movements such as squats and jumps. This helps foster the flexibility and reflexes needed for dynamic gaming.

After warming up and before the main training, a series of stretching movements should be performed. The main goal of the project is to increase the range of motion of various parts of the body, help improve the overall physical condition of the athlete, improve joint flexibility and muscle elasticity, and create conditions for the full development of muscle potential during competitions. With a sufficient range of motion, volleyball players can perform technical movements more accurately and perform more efficiently, which directly affects physical health and performance.

To develop coordination skills comprehensively, it is recommended to include a variety of exercises that help form motor memory and improve motor skills during training. Such exercises include:

Forward somersault over the top of your head. The athlete completes a jump with the elbow bent, followed by a forward flip above the head. It is also important to be able to do up to 10 repetitions evenly spaced.

The somersault goes back from the top of the head. The move consists of a reverse somersault followed by arm flexion as you land, helping to quickly regain ability after a fall.

Do somersaults on both sides. The rotation of the roll back and forth promotes symmetry and coordination of movements.

Exercises for falling and getting up quickly. These tasks are designed to develop reflexes and the ability to recover quickly from falls, which is especially important in competition.

Body action (wheel). The left and right rotating wheels help improve overall coordination and build muscle endurance.

To enrich the training process and improve the coordination of young volleyball players comprehensively, circuit training techniques are recommended. The technique consists of performing several exercises in a row, each aimed at developing a specific physical fitness:

Change the direction of movement. Exercises involving steering include dribbling exercises, stake exercises, or raised jumps, which train the ability to adapt quickly to changing environments.

Exercise the development of the strength component. Alternating throws of different weights for high jumps or long jumps with different power loads can help improve the power and accuracy of the movement.

Comprehensive exercise. In this module, tasks require alternating throws and jumps, which helps improve strength and coordination.

Walk in squat motion. Athletes use body benches to walk in full squat positions, which helps with endurance development and balance.

Walk with an extra burden on your back. To increase weight-bearing, exercises with a sandbag above the athlete's head can be added while walking, which requires concentration and improved coordination.

Group play activities. With the addition of games such as "cockfighting", teammates jump on one leg and perform ball game elements, which not only promotes the development of coordination skills but also promotes team interaction.

This set of exercises covers a wide range of techniques designed to develop coordination skills in volleyball players. From training with the ball in running or walking conditions, to stretching, general body exercises and circuit training elements – all of these not only improve technical skills, but also form stable motor memory, improve reaction speed and adaptability. This multi-stage and integrated approach to training contributes to high individual and team results, creating a strong foundation for volleyball player success.

Conclusion

The formation of coordination in junior volleyball players depends on unique physiological conditions and sensitive periods of the most active development of motor skills. The plasticity of the nervous system during this period allows you to effectively master basic and complex motor programs, laying a solid foundation for further motor growth. Personalized training methods and diverse methodological techniques help optimize the development of coordination, adaptability and reaction speed, which are also key conditions for successful training for young volleyball players. The development of coordination skills in junior volleyball players requires an integrated and systematic approach based on age-adaptation methods and exercises. The use of a variety of teaching methods – from general preparation and specialized tasks to exercises with variable parameters and circuit training elements – not only helps improve the accuracy, speed and stability of movements, but also promotes the formation of motor memory, self-discipline and adaptability. This multi-stage collaboration provides a solid foundation for the development of sports and the successful realization of the potential of young volleyball players at both the individual and team levels.

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