

## DEVELOPMENT OF SPEED-STRENGTH ABILITIES IN FUTSAL PLAYERS

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### **Abstract:**

Modern futsal is a dynamic and intense sport that requires a high level of physical fitness. One of the most important components of futsal players' physical fitness is speed and strength. These qualities enable them to move quickly across the court, perform sharp accelerations, jump, and strike the ball powerfully. This article examines the development of speed and strength in futsal players, analyzing the main training methods and their impact on athletes' physical fitness.

**Keywords:** futsal, physical fitness, speed, strength, speed and strength, sports training, physical development, athletes, game activity.

**Аннотация:** Современный футзал является динамичным и интенсивным видом спорта, который требует высокого уровня физической подготовки спортсменов. Одним из наиболее важных компонентов физической подготовленности футзальных игроков являются скоростно силовые качества. Данные качества обеспечивают возможность быстрого перемещения по площадке, выполнения резких ускорений, прыжков, а также мощных ударов по мячу. В данной статье рассматриваются особенности развития скоростно силовых качеств у футзальных игроков, анализируются основные методы тренировочного процесса и их влияние на уровень физической подготовленности спортсменов.

**Ключевые слова:** футзал, физическая подготовка, скорость, сила, скоростно силовые качества, спортивная тренировка, физическое развитие, спортсмены, игровая деятельность.

Modern futsal (mini-football) places exceptionally high demands on the functional fitness of athletes. An analysis of competitive activity shows that the game is characterized by constant changes in playing situations, a high tempo, and limited time for decision-making. Unlike traditional football, where players have the opportunity to occasionally reduce the pace, futsal players are required to perform at the limit of their abilities throughout the entire match. This is due to the smaller size of the court, the number of players on each team, and the rules allowing unlimited "flying" substitutions.

Futsal is one of the most dynamic team sports. In recent years, this sport has been actively developing in many countries around the world. The game takes place on a small court, which requires players to demonstrate high movement speed, quick reactions, and the ability to perform powerful and explosive movements. The modern level of futsal development places increased demands on the physical preparation of athletes. One of the most important components of physical training is the development of speed-strength abilities. These abilities ensure the effective execution of sprints, jumps, shots on goal, as well as rapid changes of direction.

Speed-strength abilities refer to an athlete's capacity to perform movements with high velocity and significant muscular force. For futsal players, these abilities are especially important, since the game is characterized by frequent accelerations, physical contests for the ball, and the need to respond quickly to the opponent's actions. Despite the considerable number of studies in the field of athletes' physical training, issues related to the development of speed-strength



abilities in futsal players require further investigation. The development of effective training methods that take into account the specific characteristics of this sport remains particularly relevant. In this regard, increased demands are placed on players in terms of physical, technical, and tactical preparation. Of particular importance is the development of physical qualities that enable athletes to effectively perform game actions throughout the entire match.

One of the key components of the physical fitness of futsal players is speed-strength abilities. These abilities allow athletes to execute rapid sprints, sharply change direction, and perform powerful shots on goal. In conditions of limited playing space, the ability to accelerate quickly and apply force efficiently is of decisive importance.

Speed-strength abilities represent a complex capacity of an individual to exert maximum power within a minimal period of time while maintaining optimal movement amplitude. In sports physiology, this concept is closely associated with the notion of “explosive strength” — the ability of muscles to generate significant tension at the initial phase of muscular effort.

The structure of speed-strength abilities is heterogeneous and includes several relatively independent components:

- **Fast strength** — manifested in movements where speed determines performance outcome and the athlete is required to overcome moderate resistance rapidly (for example, dribbling the ball at high speed);
- **Explosive strength** — characterized by the ability to reach maximal force during movement (starting accelerations, jumps);
- **Starting strength** — the capacity to develop force rapidly in the initial phase of muscle contraction.

It is important to emphasize the fundamental differences in the physical preparedness of football and futsal players. Research by Strikalenko (2022) demonstrates that football players are characterized by a high level of development of speed-strength abilities of the lower limbs, movement speed, and endurance. In contrast, the distinctive feature of futsal players’ physical preparedness is the emphasis on the development of reaction speed, joint mobility, and coordination of movements.

While in traditional football the dominant qualities are speed-strength abilities and endurance, in futsal flexibility, reaction speed, and short-distance movement speed come to the forefront. This is explained by tactical characteristics: indoor play requires constant changes of rhythm, instantaneous stops and starts, which are impossible without a highly developed neuromuscular system.

**Speed-strength** performance is primarily based on anaerobic energy supply mechanisms. The creatine phosphate and glycolytic pathways of ATP resynthesis enable work at maximal intensity for short durations (from 5–7 to 40–45 seconds). This correlates with game intervals in futsal, where the average duration of a player’s continuous activity is 15–25 seconds, followed by a brief substitution. The most favorable period for the development of speed-strength abilities is the pubertal stage of physiological development, when sexual maturation is accompanied by a rapid increase in muscle mass, glycogen reserves, and elevated secretion of adrenaline and sex hormones. During this period, optimal biological prerequisites are formed for the development of anaerobic capacity and maximal strength. Modern futsal is characterized by a high intensity of game actions. Players are constantly in motion, perform numerous accelerations, and actively engage in contests for the ball. All of this requires well-developed speed-strength abilities.

Issues related to the development of athletes’ physical qualities have been the subject of research by many specialists in the theory and methodology of physical education and sports training. However, the development of speed-strength abilities in futsal players has its own specificity, associated with the distinctive features of this sport. Speed-strength abilities represent



a person's capacity to perform movements at high speed with significant muscular force. These qualities play an important role in many sports; however, in team sports their significance is particularly great.

Futsal is characterized by high intensity and a rapid tempo of play. Players must respond quickly to the actions of their opponents, move efficiently around the court, and execute accurate passes and shots on goal. The performance of all these actions requires a high level of physical fitness.

One of the main features of futsal is the frequent execution of short accelerations. Players constantly perform sprints over short distances, which requires high speed and the ability to rapidly reach maximum movement velocity.

In addition, jumping movements are of great importance in futsal. Players often perform jumps to intercept the ball, contest aerial situations, or attempt a shot on goal. Such actions require well-developed explosive muscular strength.

Another important aspect is the ability to change direction quickly. During the game, athletes constantly perform turns, stops, and accelerations. All these actions require highly developed speed-strength abilities. Thus, it can be concluded that speed-strength abilities are one of the most important factors of successful competitive performance in futsal.

Physical preparation is an essential part of the training process in futsal. It is aimed at developing the physical qualities necessary for the effective execution of game actions. Athletes' physical preparation includes the development of strength, speed, endurance, flexibility, and coordination. However, for futsal players, speed and strength are of primary importance.

A specific feature of training is that exercises must correspond as closely as possible to game conditions. This approach makes it possible to develop the necessary motor skills and improve athletes' physical preparedness. During training sessions, various exercises aimed at developing speed-strength abilities are used. These include sprint running, plyometric exercises, resistance training exercises, and various game-based drills. In addition, the systematic nature of the training process is of great importance. Only regular training allows for the gradual improvement of athletes' physical qualities.

Various sports training methods are used to develop speed-strength abilities. One of the most widely applied methods is the use of plyometric exercises. Plyometric exercises contribute to the development of explosive strength of the leg muscles. They include various types of jumps, such as vertical jumps, standing long jumps, hurdle jumps, and multiple consecutive jumps (bounding).

Another important method is **sprint training**. Short accelerations over limited distances help develop speed and improve an athlete's ability to rapidly reach maximum running velocity. Exercises with additional resistance are also widely used. These include exercises with weighted equipment, resistance bands, and various training machines. Such exercises help increase muscular strength and improve movement power.

High-intensity game-based exercises also play a significant role. They allow for the simultaneous development of physical qualities and the improvement of players' technical skills. The comprehensive use of various training methods contributes to a more effective development of speed-strength abilities.

The effectiveness of physical development largely depends on the proper organization of the training process. Training sessions should be varied and include different types of exercises. It is important to consider the individual characteristics of athletes, including their age, level of physical preparedness, and playing position. For example, attacking players must possess high speed and the ability to perform rapid accelerations.



The training process should include exercises of varying intensity. This makes it possible to gradually increase physical load and prevent athlete overtraining. Proper integration of physical exercises with technical and tactical preparation is of great importance. Such an approach enables athletes to develop essential skills and enhances the effectiveness of competitive performance.

The development of speed-strength abilities is an essential component of futsal player preparation. A high level of these abilities enables athletes to successfully perform game actions and achieve high sporting results. The use of specialized exercises aimed at developing speed and strength contributes to improving athletes' physical fitness levels. Plyometric exercises, sprint training, and high-intensity game-based drills are effective means of developing speed-strength abilities.

The methodology for training speed and speed-strength abilities of futsal players includes a variety of exercises that allow athletes to demonstrate a high level of movement speed. Traditionally, these exercises are divided into general developmental and specialized categories.

General developmental exercises are aimed at enhancing the overall functional capabilities of the body. They are diverse and involve motor activities requiring quick reactions, high execution speed of individual movements, and high movement frequency. These include track and field exercises (short-distance running, jumping), resistance exercises (squats, jump squats), and gymnastic elements. Specialized exercises are structured in accordance with the movement patterns and specific manifestations of speed characteristics in competitive activity. They may be aimed at developing individual components of performance or at the comprehensive improvement of key motor actions.

Experimental studies demonstrate the high effectiveness of the interval method and circuit training method. Ukrainian researchers (Rudenko, 2023), in a six-month experiment involving young futsal players, applied a combination of resistance exercises, starting accelerations combined with reaction speed drills and ball exercises, as well as specialized weighted exercises. The results confirmed a statistically significant improvement in 30-meter sprint performance and ball dribbling.

Thus, a comprehensive approach to the training process significantly enhances the effectiveness of futsal player preparation and contributes to the development of their physical capacities.

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