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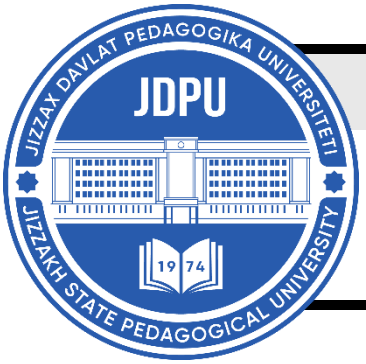

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ENHANCING SPEED AND POWER ATTRIBUTES IN MINI-FOOTBALL ATHLETES

Isomiddin Khusnutovich Turdibaev
Associate Professor of the Department of "Football Theory and Methods"
Uzbek State University of Physical Culture and Sports
Chirchik, Uzbekistan

ABOUT ARTICLE

Key words: mini-football, speed qualities, strength training, student sports, training process, motor reaction, orientation to the game, functional capabilities.

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Abstract: The study focused on the development of speed and power characteristics in athletes who specialize in mini-football. Particular emphasis was placed on the analysis of the players' performance during training sessions and competitive matches. The researchers examined changes in speed-power loads over time and proposed recommendations for the optimal structuring and distribution of training sessions to maximize athletic performance. The study highlighted the significant impact of speed and speed-power exercises on enhancing the functional abilities of athletes in the experimental group, particularly their capacity to perform dynamic movements within complex game situations. Additionally, the findings underscored the importance of implementing targeted methods aimed at improving technical and tactical proficiency, as well as refining visual perception and reaction times, which are critical for effective decision-making and performance in fast-paced mini-football environments.

Introduction. For mini-football athletes, physical preparation constitutes a fundamental component of the overall training process. Its primary objective is to enhance the general functional condition of the players, increase their movement activity, and ensure optimal performance during games. In the development of physical fitness, key factors such as

strength, speed, endurance, coordination, and flexibility are carefully considered. Consequently, the training process is structured into three main stages: general, special, and auxiliary physical training.

General physical training (GPT) is designed to comprehensively develop the primary physical qualities of athletes. This stage plays a critical role in building endurance, muscular strength, and movement coordination, all of which are essential for achieving high performance during mini-football matches. Special physical training (SPT), tailored to the specific demands of mini-football, focuses on increasing players' activity levels and the overall pace of the game. Key components at this stage include short sprints, rapid changes of direction, reaction speed, and the development of explosive power. Auxiliary physical training (APT) is built upon the foundation established by GPT and is aimed at adapting the athletes' bodies to increasing physical loads. This stage supports the improvement of technical skills, enhances endurance, and accelerates muscle recovery after intensive efforts [2,5].

The integrated application of all three training stages is crucial, as it allows athletes to demonstrate high speed, endurance, and technical efficiency during gameplay. For the effective development of mini-football players, particular attention must be paid to cultivating motor abilities such as speed, strength, endurance, and flexibility. Individualized training programs, tailored to the physical condition of each athlete, are of significant importance in achieving optimal results [2,3].

Scientific research has provided insights into various factors influencing sports performance, including technical-tactical skills, physical conditioning, psychological preparedness, and cognitive development. However, the training methodologies for mini-football athletes have not yet been explored in sufficient depth, largely due to the relatively recent emergence of this sport in certain regions [1,4].

At present, optimizing the training system to enhance speed and strength qualities in mini-football players remains a pressing challenge. Ensuring athletes' successful participation in competitions requires a carefully structured training process, which includes the rational allocation of time between bilateral games, technical and tactical drills, and physical conditioning.

Materials and methods

Purpose of the Research: The purpose of this study is to develop and refine methods for enhancing speed-strength qualities in athletes specializing in mini-football.

Research Objectives:

1. To examine and analyze existing methods and tools for developing speed-strength qualities in football players, compare their effectiveness, and identify the most efficient approaches.

2. To design and implement innovative training techniques specifically aimed at improving speed-strength capabilities in mini-football athletes.

3. To develop a comprehensive set of control tests to evaluate the level of speed-strength development and monitor its dynamics throughout the training process.

4. To investigate the players' ability to perform in complex game situations and assess the impact of specialized exercises on their visual perception and motor coordination.

Research Methods: To achieve the objectives, the following methods were applied:

1. Systematic analysis of scientific and methodological literature;

2. Pedagogical observation of training and educational processes;

3. Evaluation and analysis of competitive performance of mini-football players;

4. Conducting expert discussions and consultations with coaches, sports scientists, and mini-football specialists;

5. Administration of control tests to assess the effectiveness of speed-strength exercises.

Result and discussion. The implementation of specialized microcycles focused on sprint training plays a crucial role in enhancing the speed qualities of mini-football players and improving their overall efficiency within the training process. Modern sports training is characterized by high intensity and substantial training loads, which can lead to increased physical fatigue in athletes and limit their capacity to fully express their speed potential. Consequently, the careful and rational planning of specialized speed-focused microcycles is essential for optimizing recovery, minimizing the adverse effects of fatigue, and ensuring consistent performance development.

When these sprint-oriented microcycles are incorporated into the training schedule following recovery periods, athletes exhibit improved adaptation to physical loads. This structured approach facilitates the effective development of speed capabilities, allowing players to demonstrate maximum velocity and perform high-intensity actions more efficiently during matches.

Additionally, considering the individual characteristics of each player, psychological training based on a personalized approach significantly enhances performance outcomes. Certain athletes may perform optimally under high stress, whereas others require targeted exercises to develop their capacity to function effectively under pressure. Therefore, the

inclusion of psychological assessments, concentration drills, and reflex-enhancing techniques within training sessions is highly recommended.

Moreover, situational exercises that closely simulate real game conditions contribute to the development of tactical thinking and decision-making skills. To improve the speed and accuracy of players' responses, drills focusing on hand-eye coordination, rapid decision-making, and anticipatory action planning are essential. Furthermore, the integration of innovative technologies into the training process, including virtual simulators and analytical software, allows players to enhance perceptual sensitivity, react swiftly, and execute actions effectively under dynamic game conditions.

Overall, the combination of structured sprint microcycles, personalized psychological preparation, and situational tactical exercises, supported by modern technological tools, creates a comprehensive framework for the development of mini-football players' speed, tactical intelligence, and game efficiency.

The effective development of speed abilities in mini-football athletes requires careful consideration of various training load parameters, including the type and duration of exercises, intensity levels, length of recovery intervals, and the number of repetitions. Training aimed at enhancing speed should adhere to several fundamental principles:

1. Exercise Variety: To comprehensively develop speed qualities, a combination of general, specialized, and competitive exercises should be used. Incorporating reactive, acceleration, and coordination elements helps athletes quickly adapt to dynamic game situations and make faster decisions on the field.

2. Mastery of Movement Technique: Speed exercises should be well-known to athletes so that the focus remains on speed development rather than on learning new techniques. Utilizing kinematic and biomechanical analyses can further refine movement coordination and enhance efficiency.

3. Exercise Duration: The duration of each exercise depends on its specific purpose. For instance, drills designed to develop starting speed and reaction time are executed in very short bursts, often fractions of a second, while complex technical elements may be performed for 5–10 seconds.

4. Load Intensity: Developing speed qualities requires high or maximal intensity exercises to stimulate physiological adaptation. Optimal performance is determined by individual effort levels and the amplitude of controlled movements.

5. Intensity Variation: To avoid reaching a "speed plateau," exercise intensity should vary within the range of 85–95% of maximum effort. This prevents stabilization of movement patterns and promotes continued improvement in speed abilities.

6. Optimal Recovery Intervals: Recovery periods between repetitions must allow sufficient restoration of the central nervous system and partial clearance of anaerobic glycolysis metabolites. Properly balanced recovery ensures sustained functional activity throughout training.

7. Prevention of Fatigue Accumulation: Excessively short recovery periods can lead to metabolite buildup, reduce performance, and shift work into the anaerobic zone, which impairs pure speed development. Adequate recovery is essential to maintain high-quality performance.

8. Sequential Execution of Exercises:For effective training, speed exercises should be performed in sequences such as:

- 5–6 repetitions of 5–10 seconds each;
- 3–4 repetitions of 15–20 seconds each;
- 2–3 repetitions of 25–30 seconds each.

The recovery interval between sets should range from 2 to 5 minutes, depending on the nature and intensity of the exercises. Following these principles ensures that mini-football players can effectively enhance their speed capacities while maintaining high levels of performance throughout training and competitive play.

Isokinetic Method in Strength Training of Mini-Football Players

One of the most effective approaches to strength training in mini-football, according to experts, is the isokinetic method. This method enables athletes to develop optimal strength and endurance under controlled conditions. Isokinetic exercises are performed on specialized simulators, where movements are executed through a full range of motion at variable speeds while applying maximum force. This allows athletes to work efficiently, overcoming many of the limitations associated with traditional strength training exercises.

Advantages of the Isokinetic Method:

1. Optimal Muscle Load: During each phase of movement, muscles experience the most effective load, which contributes to both strength and endurance development. Isokinetic exercise machines provide resistance tailored to the athlete’s actions, ensuring a natural and highly effective development process.

2. Comprehensive Muscle Engagement: Unlike traditional exercises that often target individual muscle groups, the isokinetic method engages complex muscle systems. This

is particularly important for mini-football players, as their sport requires simultaneous coordination of multiple muscle groups during gameplay.

3. Reduced Risk of Injury: Isokinetic exercises are performed under controlled conditions, which minimizes stress on muscles, tendons, and ligaments. Traditional strength training with improper load distribution can increase the risk of injury, whereas isokinetic machines significantly reduce this risk.

4. Efficiency and Time-Saving: The isokinetic method allows exercises to be performed more quickly, and the subsequent recovery process is comparatively shorter. This makes it an efficient tool for integrating strength training into the overall physical preparation of athletes.

5. Load Flexibility and Individualization: Isokinetic machines automatically adjust resistance according to the athlete's current physical capabilities, providing a highly individualized approach to training that maximizes results for each player.

6. Improvement of Speed Indicators: Isokinetic movements can reach speeds of up to 2000 degrees per second, significantly higher than isotonic exercises, which usually operate within 45–600 degrees per second. This is particularly valuable for mini-football players, who frequently perform rapid, high-intensity movements during matches, such as quick changes of direction, fast runs, ball control, and rapid shots.

Based on scientific findings, special exercises were developed and implemented to enhance mini-football players' peripheral vision, reaction speed, and attention concentration. These exercises were designed to improve cognitive and sensorimotor abilities effectively, ensuring that players could better respond to dynamic game situations. The practical methodology consisted of the following components:

- Development of Visual Perception in Game Conditions: Players were trained to perceive signals in limited visual conditions or through reflective surfaces, simulating realistic movement scenarios. This approach supports sensorimotor integration and fosters independent spatial orientation on the field.
- Enhancement of Visual-Motor Reactivity: Using visual stimuli such as light signals, moving objects, or sudden changes in the environment, players were trained to respond rapidly, thereby strengthening perceptual speed and reactive capabilities.
- Tactical Anticipation and Decision-Making Models: Exercises replicating real-game situations were used to train players in cognitive processing and selecting optimal solutions under pressure. This method accelerates the adaptation of cognitive functions and enhances players' ability to respond effectively to the dynamic pace of mini-football matches.

These methodological approaches not only improve spatial orientation and rapid decision-making but also enhance overall accuracy in sports performance. The development of visual-motor coordination and cognitive skills is a crucial component of strategic preparation for mini-football athletes.

Practical Outcomes of the Research: The results demonstrated that exercises focused on spatial orientation significantly improved players' efficiency in performing rapid technical actions. By simulating dynamic game scenarios, players increased the speed of their decision-making, improved their ability to collectively choose optimal positions, and anticipated opponents' actions more effectively.

Systematic Development of Orientation Skills: A structured approach was applied to progressively enhance players' attention, reaction, and sensorimotor integration. The training system included:

- Complex Reaction Training: Exercises conducted under time pressure to accelerate neuropsychological and motor responses, facilitating optimal decision-making in fast-paced conditions.
- Peripheral and Central Vision Improvement: Players were trained to process visual information from both central and peripheral fields, allowing comprehensive analysis of movements on the field and reinforcing visual-spatial awareness.
- Rapid Attention Switching: Drills designed to enhance cognitive flexibility, enabling players to make quick decisions in highly variable game situations.
- Distribution of Attention and Sensorimotor Coordination: Training aimed at improving simultaneous processing of visual, tactile, and auditory information, enhancing players' multi-sensory integration and decision-making under dynamic conditions.

The comprehensive application of these methods contributed to the improvement of tactical thinking, visual-motor coordination, and reactive abilities. Special orientation exercises are therefore not only a supplement to tactical and technical training but also a vital component for enhancing reaction speed, movement coordination, and overall physical preparation. For mini-football players, the harmonious development of cognitive and sensorimotor abilities is essential for achieving high-level performance in competitive conditions.

Conclusions

1. Current scientific literature on mini-football, particularly regarding student-athletes, lacks comprehensive and systematic recommendations for the development of speed and power qualities. Analysis of the actions of qualified football players and student-athletes shows that mini-football involves highly dynamic movements—including sprints, sharp stops,

rapid changes of direction, kicks, dribbles, jumps, falls, and high-intensity ball challenges—which demand both speed and strength from players.

2. Experimental research conducted at the Uzbekistan State University of Physical Culture and Sports confirmed the effectiveness of various teaching methods. An optimal distribution of exercises was determined: 50% technical training, 40% physical training, and 10% tactical training. This ratio allows for the adaptation of training to individual athlete characteristics, preparation stages, and specific goals, ensuring effective and balanced development.

3. The inclusion of speed and strength exercises that replicate the game environment enhances training efficiency and motivation. Exercises involving interaction with the ball and opponents facilitate better motor skill formation and accelerate the development of functional capabilities. Research results indicate that such exercises improve players' speed and strength, increase attention and stability, and enhance muscle-motor coordination, perceptual accuracy, and depth vision.

4. To improve the ability to move effectively in dynamic game conditions, training must include exercises that simultaneously develop sensorimotor and cognitive abilities. This approach strengthens rapid perception, situational analysis, and timely decision-making. Increasing the complexity of perceptual conditions—such as introducing multiple objects, expanding peripheral vision, reducing analysis time, and integrating tactical signals—further develops spatial orientation skills. Future research should focus on assessing mini-football players' agility-strength potential, identifying the mechanisms that underlie rapid adaptation to changing game environments, and developing training methods to enhance these adaptive abilities.

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