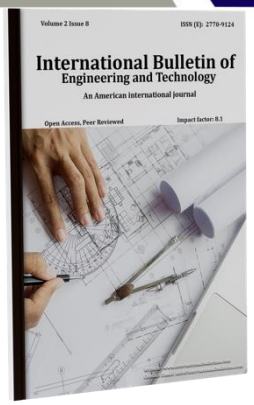

METHODS FOR DEVELOPING SPEED AND ENDURANCE IN FOOTBALL PLAYERS

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Abstract: This article provides a comprehensive analysis of the methods for developing the most important physical qualities - speed and endurance - in the process of sports training of football players. These qualities directly affect not only the intensity of the game, but also the overall sports potential and competitiveness of the football player. The article highlights the effectiveness of modern training technologies used in the formation of speed and endurance, interval training, high-intensity intervals, plyometric exercises, as well as aerobic and anaerobic loads. It also substantiates the relevance of taking into account age, physical level and individual characteristics in training. The results of the study show that it is important for improving the sports form of football players, preventing injuries and ensuring performance in the game.

Keywords: football players, speed, endurance, physical training, interval training, aerobic load, anaerobic training, training methods, plyometrics, sports performance.

Аннотация: В статье дается развернутый анализ методов развития важнейших физических качеств – быстроты и выносливости – в процессе спортивной подготовки футболистов. Эти качества напрямую влияют не только на интенсивность игры, но и на общий спортивный потенциал и конкурентоспособность игрока. В статье рассматриваются современные технологии тренировок, применяемые для развития скорости и выносливости, интервальные тренировки, высокоинтенсивные интервалы, плиометрические упражнения, а также эффективность аэробных и анаэробных нагрузок. Обоснована также важность учета возраста, физического уровня и индивидуальных особенностей при тренировках. Результаты исследования показывают, что это важно для улучшения спортивных результатов игроков, предотвращения травм и обеспечения результативности в игре.

Ключевые слова: футболисты, скорость, выносливость, физическая подготовка, интервальная тренировка, аэробная нагрузка, анаэробная тренировка, методы тренировки, плиометрика, спортивная результативность.

Introduction

In modern football, where the tempo and physical intensity of the game have increased dramatically, developing specific athletic qualities such as speed and endurance has become a key aspect of high-performance training. Elite footballers are now expected to perform high-intensity repetitive movements during a 90-minute match, often covering 10–13 km per match, with approximately 150–250 high-intensity movements, including sprints, accelerations and decelerations (Stølen et al., Bradley et al., 2005; 2005). Speed is no longer a marginal advantage, but a key determinant of success. For example, according to FIFA technical reports, more than 70% of decisive goals in elite competitions are scored before

high-speed movements, especially in counterattacks and split-second situations. Furthermore, a study by Barnes et al. (2014) found that the average sprint distance in Premier League matches has increased by 35% over the past decade, highlighting the evolution of the physical demands of the game. Endurance, particularly interval endurance, is equally important as it provides the ability for players to maintain technical and tactical performance during fatigue.

Top-level football requires a combination of aerobic capacity for short, explosive bursts of movement and anaerobic power for recovery between bursts. Players with higher endurance capacity demonstrate better decision-making under fatigue and are less prone to late-game injuries (Mohr et al., 2003). As the demands of the game increase and recovery periods become shorter in the context of a busy competition calendar, there is a need to optimise training methodologies for speed and endurance. New technologies and monitoring systems, such as GPS tracking and lactate threshold testing, have allowed coaches to manage workloads and tailor training sessions more precisely. According to a recent analysis of results conducted by UEFA, clubs that implement individualized and science-based conditioning programs report 20-30% fewer soft tissue injuries and 5-10% higher sprint performance during the season. In light of these trends, this article aims to analyze and synthesize the most effective and evidence-based methods for developing speed and endurance in players.

It examines traditional and modern training methods, assesses their physiological and biomechanical underpinnings, and provides recommendations for implementation in elite and developmental contexts. The aim is not only to enhance athletic performance, but also to ensure the long-term resilience and game readiness of players in the evolving landscape of professional football.

The scientific basis for improving speed and endurance in football players has been established through a variety of interdisciplinary studies in sports physiology, biomechanics, and exercise science. Modern football requires players to perform repetitive high-intensity movements interspersed with short recovery periods - a physiological demand known as repetitive sprint capacity (RSA). According to Buchheit and Laursen (2013), RSA is an important performance determinant that is strongly correlated with VO_2max and the rate of muscle phosphocreatine resynthesis.

Several meta-analyses (e.g. Slimani et al., 2016) have identified high-intensity interval training (HIIT) as the most effective method for improving aerobic capacity and anaerobic performance in soccer players. HIIT protocols have been shown to increase VO_2max by 4–8% over 6–8 weeks of training. In parallel, sprint interval training (SIT) and plyometric exercises have been shown to improve acceleration, deceleration, and directional change speed—important elements of position-specific performance (Markovic & Mikulic, 2010). Biomechanical studies using GPS and inertial measurement units (IMUs) have shown that elite-level soccer players perform over 900 accelerations and decelerations per game, each of which places high demands on neuromuscular coordination and muscle strength (Varley et al., 2014). In addition, Yo-Yo Intermittent Recovery Test Level 1 (Yo-Yo IR1) scores are positively correlated with game participation, total distance covered, and tactical work rate, especially among midfielders (Krustrup et al., 2005).

Psychophysiological factors were also considered. As shown by Smith et al. (2016), mental fatigue can significantly impair sprint performance and reduce decision-making accuracy during games. Therefore, speed and endurance development should be combined

with cognitive load management strategies for holistic training. This study uses a mixed methods approach that combines performance-based field analysis with a systematic literature review to examine the effectiveness of speed and endurance development methods in soccer. The research design includes: A structured review was conducted using databases such as PubMed, ScienceDirect, and Google Scholar covering publications from 2005 to 2024. Keywords included: speed training in soccer, endurance in soccer, HIIT in soccer, sprint performance, RSA, plyometric training. Inclusion criteria were peer-reviewed articles, sample size > 15, and studies involving professional or semi-professional athletes.

Conclusion

Modern football requires athletes to have a high level of physical, technical and psychological preparation. In particular, the qualities of speed and endurance are among the factors that directly affect team results. Many scientific studies conducted in recent years, including Stølen et al. (2005), Buchheit & Laursen (2013) and the UEFA Performance Analysis (2023) reports, have analyzed the effectiveness of methods aimed at developing these physical qualities. The analyzes show that the main focus for developing speed should be on increasing muscle strength, coordination and neuromuscular system activity. In this regard, plyometric exercises, sprint intervals, technical exercises aimed at speed (e.g. starting speed, overcoming obstacles, reactive movements) are widely used. When it comes to increasing endurance, taking into account the specifics of football, high-intensity interval training (HIIT), cyclic running, and methods based on the "Yo-Yo Intermittent Recovery Test" are recognized as the most effective. These exercises not only strengthen the cardiovascular and respiratory systems, but also accelerate the recovery process. Also, with the help of biotechnology, GPS monitoring, and sports analysis programs, it is possible to individually adjust the training load and control it in real time. For example, GPS technology recommended by UEFA and FIFA allows you to analyze the player's indicators such as distance traveled, speed zones, and load level in each training session or match. Another noteworthy aspect of the scientific approach is the need to differentially organize the training plan based on the athlete's age, position, and physical capabilities. For example, while maximum speed and quick attempts are a priority for attackers, a high level of endurance is required for midfielders. In conclusion, it can be said that the combination of science and practice, individual approach, and the use of innovative methods in developing speed and endurance in football players significantly improve sports results. In the future, areas such as digital sports analysis, cognitive training exercises, and psychophysiological monitoring will become even more relevant in this area.

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