

Research on Countermeasures to Improve the Development Level of College Middle and Long Distance Running Teams

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Abstract

Middle - and long - distance running occupies an important position in sports. The development of middle - and long - distance running teams in universities plays a significant role in enhancing China's overall competitive strength in this sport and promoting the construction of a sports power. However, the development of middle - and long - distance running in universities is also influenced by many factors. This paper proposes suggestions such as strengthening the construction of the coaching staff, enhancing the ideological and political education of athletes, improving the management system of the sport, formulating strict training plans, strengthening supervision of the athletes' training process, carrying out campus middle - and long - distance running activities, and enhancing scientific research capabilities to promote the development and growth of middle - and long - distance running teams.

Keywords

Sports team; Ecosystem; Middle - and long - distance running; Development.

1. Introduction

With the advancement of the integration of sports and education reform, the quality of sports team construction in universities has been increasingly valued by the state. As the cradle and training base for competitive sports reserve talents, the quality of their construction is constantly improving. On October 25, 2021, the "14th Five-Year Plan for Sports Development" was promulgated, marking the beginning of a new journey towards building a modern socialist sports power in China, in which university competitive sports have made outstanding contributions. Athletics is known as the "mother of sports," and middle- and long-distance running is an important part of it, including events such as the 800 meters, 1500 meters, 3000-meter steeplechase, 5000 meters, 10000 meters, and marathon. China's middle- and long-distance running once enjoyed great glory, with the "Ma's Army" becoming famous worldwide in the 1990s. However, its performance declined later, and the gap with the world level widened. In recent years, with the vigorous development of sports by the country, China's middle- and long-distance running results have gradually improved, and a number of outstanding athletes have emerged. However, to enter the world-class level, continuous efforts are still needed to explore a development path suitable for China's middle- and long-distance running projects. In the current increasingly fierce competitive sports environment, building a world-class middle- and long-distance running team is an important step to break into the forefront of the world's competitive sports. Universities, as the training base for outstanding sports talents, have cultivated countless competitive sports talents and made great contributions to the development of China's sports industry. Middle- and long-distance running is an important part of the construction and development of university competitive sports and a vital force in supporting China's competitive sports. Whether a world-class training base can be established depends on the more scientific and systematic approaches in talent selection, training,

competition, and management. Therefore, this paper aims to propose effective strategies to promote the development and growth of middle- and long-distance running teams in universities.

2. Overview of the Development of Middle and Long Distance Running Projects

2.1. Definition of Middle and Long Distance Running Projects

Middle and long-distance running is a typical cyclical endurance sport, encompassing both middle-distance and long-distance races. This sport is widely practiced globally, from local and regional competitions to international events. The Olympic program includes men's and women's 800 meters and 1500 meters middle-distance races, as well as 5000 meters and 10000 meters long-distance races, along with non-Olympic events such as the marathon and 3000-meter steeplechase.

Middle and long-distance running features a mixed metabolic system that combines aerobic metabolism, glycolysis, and ATP-CP (phosphagen) energy systems. As the distance increases, the metabolic pattern shifts from primarily anaerobic to predominantly aerobic. The maximum oxygen uptake and lactate threshold are key indicators of an athlete's aerobic endurance. Middle and long-distance running demands high physical fitness, including excellent aerobic endurance, anaerobic endurance, and strength endurance. During the race, maintaining a steady pace and breathing is crucial to maximize potential and achieve peak performance. This sport is both challenging and thrilling, testing the athletes' physical strength, skills, and mental fortitude. In China, the history of middle and long-distance running dates back to 1910, with competitions held annually, and the sport has since grown and thrived.

2.2. Research status of domestic middle and long distance running training and technology development

Starting with the renowned domestic long-distance running coach Ma Junren, research on middle and long-distance running training began to form its own perspective while drawing on international practices. Ma Junren pioneered the 'three oxygen' comprehensive training method, emphasizing that all three aspects of training (aerobic, anaerobic, and mixed training) should be integrated, with attention to the reasonable arrangement of the proportions, combinations, methods, class intervals, load volume, load intensity, training stages, and specific requirements of the three oxygen aspects[1].

In his article 'Research on the Characteristics of Middle and Long-Distance Running Training in China,' Bi Hongxing noted that competitive training for middle and long-distance running is the final stage of the training process, primarily involving athletes who have successfully completed specialized training tasks. If there are differences in skill levels, athletes can participate in lower-level competitions and undergo corresponding training[2].

In his book 'Sports Training Science,' Tian Maijiu outlined the basic characteristics of modern sports training: the development of modern middle and long-distance running techniques is characterized by the integration of middle and long-distance running techniques. In the past, people clearly separated middle and long-distance running techniques, believing that middle-distance runners needed a large stride, strong rhythm, and power, while long-distance runners required a small stride, a relaxed pace, and a fast frequency. Now, it seems that middle and long-distance running techniques are being integrated[3].

Wang Renjia (2021) pointed out in his exploration of middle and long-distance running techniques that daily training also emphasizes a faster frequency but a relatively smaller stride, aiming for a more stable running style. Middle and long-distance running is typically divided into three parts: the start, the middle run, and the finish sprint. The start uses a standing start

to gain an advantage. During the middle run, attention is paid to maintaining a forward lean, controlling the arm swing amplitude and the force of the back kick, often using the method of exhaling every three steps. To enhance the effectiveness of middle and long-distance running training, it is essential to help athletes overcome the 'critical point' and strive for a 'second wind.' The principle of 'speed-centered' training should be emphasized [4].

Chu Hui 'an (2016) proposed in his analysis of the biomechanics of the top eight female 5000 meters runners at the 12th National Games that Chinese coaches should focus on developing the strength and endurance of the ankle flexion and extension muscle groups, enhancing the ankle's shock absorption and push-off capabilities. It is also important to consider how technical factors affect speed endurance, analyze these factors, and assist athletes in maintaining a stable technique throughout the race, thereby maximizing the efficiency and effectiveness of their running techniques [5].

Zhu Yuan (2019) explored effective training methods for middle and long-distance running. His research highlighted the importance of speed training, emphasizing the need to focus on speed, enhance acceleration in the latter stages, prioritize speed strength, implement flexibility training, improve mental fortitude, and conduct technical training in a reasonable manner [6].

2.3. Research on the construction of domestic middle and long distance running sports team

Lu Yongzhong (2016) focused on the competitive athletics in Gansu Province. His research highlighted the need for long-term development in athletics, particularly in middle and long-distance running. He proposed establishing systems that align with the market economy, setting up scientific and healthy operational and support mechanisms, and fostering a collaborative environment among society, families, and schools for athletic development [7].

Teng Haining, in his discussion on the current status and development of high-level middle and long-distance running teams in universities, suggested helping athletes establish correct training motivations, increasing competition opportunities, enhancing coaches' training skills, reforming and establishing a talent development system, improving coaches' overall professional capabilities, and vigorously developing a 'sports and education integration' training system [8].

It is crucial to clearly define the goals of high-level middle and long-distance running training, ensuring they remain aligned with national needs, with the ultimate aim of cultivating and delivering outstanding sports talents to the country. College athletes should represent their schools, provinces, cities, and the nation in major domestic and international athletics competitions. To achieve this, it is necessary to reform the existing system, broaden recruitment channels, implement effective measures to improve coaches' professional skills, increase financial investment, adopt a market-oriented approach, integrate sports and education, and further refine the training system [9].

The development of high-level middle and long-distance running teams in universities has distinct characteristics, forming a pattern of speed, endurance, and comprehensive strength. These changes indicate improvements and enhancements in the training process of middle and long-distance running projects. Additionally, they show that the physical fitness and specialized training of athletes are becoming increasingly unified, leading to the establishment and creation of new methods for middle and long-distance running training that emphasize speed and overall strength [10]. The cultivation of the optimal competitive state for middle and long-distance runners is the ultimate goal of training, encompassing physical, technical, tactical, and neurological factors. Coaches and athletes should summarize their experiences, while universities should scientifically analyze the experiences of outstanding performers and promote these practices to enhance the level of middle and long-distance running.

Mu Yingxiu (2015) proposed measures for the development of middle and long-distance running in the Guizhou Provincial Track and Field Team, including introducing faculty, expanding talent selection, strengthening scientific research, enhancing the cultural literacy of coaches and athletes, improving mechanisms for retirement and employment, and refining training methods (combining sub-highland, highland, and plain training). These measures emphasize institutional norms to promote healthy development[11].

Jiang Zhenguo and Xu Qing noted that training is crucial for enhancing middle and long-distance running capabilities and cultivating high-level talent. They advocate for a systematic analysis of training trends and talent needs, grounded in the context of contemporary development, to accurately identify trends, continuously improve the entire training process, enhance training standards, ensure the quality of talent cultivation under the concept of quality education, and advance sports education to a higher level[12].

2.4. Summary

With the advancement of the economy and technology, the state has increased its support for high-level sports teams in universities. Universities, leveraging their rich coaching resources and specialized disciplines such as physical education, sports training, and sports rehabilitation, provide scientific training support for middle and long-distance running teams. This approach breaks down information barriers, promotes communication and learning, and fosters a favorable environment for the development of middle and long-distance running. The training philosophy and technology of domestic middle and long-distance running have continuously evolved. The training philosophy has shifted from a single approach to a more comprehensive one, with the 'three oxygen' training method integrating aerobic, anaerobic, and mixed oxygen training, making it more scientific and targeted. Technically, middle and long-distance running has been integrated, emphasizing comprehensiveness and continuity, with speed as the core focus. By increasing frequency, stride length, and acceleration in the latter stages, athletes' competitiveness is enhanced. At the same time, starting and mid-race techniques are standardized to help athletes overcome the 'critical point,' 'achieve a second wind,' and improve endurance and stability.

In terms of team building, domestic middle and long-distance running has laid a solid foundation for sustainable development through the improvement of the talent cultivation system, enhancing the overall quality of coaches and athletes, and reforming the training system and support mechanisms. In the future, attention should be paid to individual differences, personalized training plans should be developed; the application of technology should be strengthened to promote innovation; and interdisciplinary research should be deepened to explore scientific theories. These improvements will provide comprehensive support for the development of middle and long-distance running and serve as important references for the development of university sports teams.

3. Key Elements in the Development of Middle and Long Distance Running Projects

3.1. The importance of building a team of middle and long distance running teachers

The development of middle and long-distance running teachers is significant on multiple levels. From the athletes' perspective, these teachers can provide scientific training programs, reduce the risk of injury, foster resilience, and significantly extend their careers. Moreover, it plays a crucial role in showcasing the school's comprehensive sports capabilities and promoting the development of sports and mass fitness activities.

In the university setting, physical education teachers are responsible for multiple roles, including teaching, training, maintaining sports facilities, and conducting sports research. In this context, coaching is just one of many roles. However, many training tasks require coaches with excellent demonstration skills, which means they must not only have strong teaching abilities but also extensive experience in specialized sports practices[13]. Moreover, the teacher's expertise in a specific sport significantly influences their teaching ability. Teachers who are proficient in a particular sport can better understand the selection criteria, training methods, and nutritional recovery strategies for that sport, and can offer valuable practical suggestions for improving, reinforcing, and enhancing the training process based on their own experience.

The motivations of coaches in middle and long-distance running training reflect their understanding and attitudes towards this work, which directly influence their behavior and training outcomes, and ultimately impact the development of middle and long-distance running. In the context of continuously improving competitive standards, relying solely on past experiences for training has become outdated, and the existing knowledge system is no longer sufficient to adapt to the evolving landscape. Therefore, coaches need not only extensive sports experience and coaching expertise but also a substantial amount of theoretical knowledge to support scientific training[14]. Middle and long-distance running has distinct characteristics, with significant differences among various events, involving a broad range of knowledge. To meet these requirements, coaches must accelerate the updating of their knowledge and enhance their specialized skills in middle and long-distance running. The most effective way to improve teachers' quality and level is through training. Training is the fastest and most effective means to promote advanced sports concepts and methods, and it is also crucial for enhancing the quality and efficiency of sports in China[15]. Through systematic training, coaches can learn the latest training philosophies, scientific methods, and advanced sports rehabilitation techniques, thereby better guiding student training, improving training outcomes, and promoting the development of middle and long-distance running.

3.2. The Importance of the Comprehensive Quality of Middle and Long Distance Runners

The overall quality of middle and long-distance runners is of paramount importance in competitive sports. The current trend in middle and long-distance training is shifting from early aerobic metabolism training to a combination of aerobic and anaerobic metabolism, along with corresponding functional capabilities. Modern middle and long-distance runners must not only have exceptional aerobic endurance but also excellent speed and speed endurance[16]. Training focuses on aerobic endurance, speed, and anaerobic endurance, each corresponding to the primary energy systems: oxidative energy, phosphagen, and glycolytic systems. It is important to note that in middle and long-distance running, shorter distances like 800m and 1500m are common, while longer distances such as 5000m and beyond are more challenging. The primary energy systems for different distances vary, necessitating tailored training programs. An athlete's physical fitness is determined by body shape, physical function, and athletic qualities. Middle and long-distance running emphasizes physical fitness and endurance, and an athlete's ability to win in intense competitions largely depends on their physical fitness. [17]. Psychological qualities are also a crucial component of an athlete's competitive level. Athletes with strong psychological qualities can better handle the pressure of competition, stay calm and focused, and perform at their best. However, an athlete's mental resilience not only depends on their own abilities but also requires the guidance of coaches. Therefore, coaches should understand the athletes' thoughts, analyze and grasp their mental states, promptly identify issues, actively guide and assist in resolving them, provide appropriate rewards and

punishments, and help athletes combine their passion with the pursuit of excellence, thereby enhancing their sense of happiness and pride[18].

3.3. The Importance of Management in Middle and Long Distance Running Teams

A development strategy is a significant, overarching, or comprehensive plan. It serves as a compass for guiding people in practical activities to achieve their goals. Therefore, middle and long-distance running teams need to develop a strategy that suits their needs. The management of these teams involves key issues such as the team's overall competitive strength and healthy, sustainable development. This process includes managing the individuals involved and overseeing the entire training process.

The nutritional intake and health management of athletes are crucial. Nutrition serves as the power source for athletes' training and competitions, impacting the development of internal strength, physical adaptability, recovery, and the prevention of sports-related injuries[19]. Athletes must maintain a balanced diet to sustain their peak condition and enhance their competitive edge. During training, athletes use anabolic processes to promote anabolic effects, requiring a strong work ethic. Additionally, biological monitoring and regulation of the training process can ensure a steady improvement in competitive performance, reducing the risk of stagnation or regression due to injuries.

The management of sports teams is to avoid the problems of laxity and disunity. Unreasonable management may lead to the disintegration of the team, and eventually form a vicious circle. Therefore, strengthening the management of middle and long distance running teams is of great significance to the development of middle and long distance running projects.

3.4. The Importance of Venues and Facilities for Middle and Long Distance Running Projects

The development of middle and long-distance running projects relies heavily on the support of physical infrastructure, such as venues and facilities. On one hand, athletes' performance is continuously enhanced through training, and well-equipped training venues and advanced equipment can provide top-notch training conditions, thereby elevating their training to new heights. On the other hand, high-quality competition venues and comprehensive facilities not only create a better competitive environment for athletes but also enhance the audience's viewing experience, increasing the event's appeal and influence. Moreover, the continuous improvement and development of venues and facilities can ignite the training passion of athletes and coaches. When they have excellent training environments and resources, they are more motivated to strive for excellence and constantly push their limits. Advanced venues and facilities also provide strong support for the formulation of scientific and reasonable training plans. For instance, with precise timing systems and professional sports monitoring equipment, coaches can more accurately assess athletes' performance and adjust training plans based on data feedback, making training more scientific and efficient. The development of middle and long-distance running projects is closely tied to the physical infrastructure, such as venues and facilities. High-quality training venues and advanced equipment are crucial for enhancing athletes' training levels, while well-equipped competition venues and facilities can optimize the competition experience and attract more attention. At the same time, comprehensive venues and facilities can inspire the training passion of athletes and coaches and provide a solid basis for the formulation of scientific training plans. Therefore, prioritizing the construction and development of venues and facilities is essential for promoting the overall progress of middle and long-distance running projects.

4. Comprehensive Development Strategies for Middle and Long Distance Running Projects

4.1. Strengthening the Construction of the Middle and Long Distance Running Teacher Team

To enhance teachers' skills in teaching and training middle and long-distance running, actively recruit teachers with expertise in this area; clarify the division of labor among teachers, organize more training sessions for teachers, increase opportunities for academic discussions and exchanges, and foster solid innovative thinking and practical skills; establish a reward and punishment system to boost coaches' enthusiasm, promote competition and cooperation between our school's teachers and those from other universities, and motivate continuous improvement, thereby comprehensively enhancing teachers' training, innovation, management, coordination, and research capabilities; school leaders should provide more attention and support to strengthen research capabilities, improve educational quality, build first-class sports disciplines, add new sports majors, and broaden talent selection channels; the faculty of the School of Physical Education should focus on long-term development, conduct sports research, improve teaching standards, strengthen medical supervision, nutrition management, information collection, and feedback.

4.2. Enhancing the Comprehensive Quality of Middle and Long Distance Runners

Strengthen the ideological and political education of athletes to ignite their passion for training and cultivate a strong will to endure hardships. Emphasize basic physical fitness training to build a solid foundation, and organize more competitions to gain experience and push the limits. Coordinate training schedules across various aspects, adopt flexible time arrangements, and vary training methods to enhance athletes' adaptability to different training times. Leverage the expertise of non-sports majors who excel in middle and long-distance running by providing professional training guidance, expand the middle and long-distance running team, and foster a group running culture to promote mutual improvement. Promote middle and long-distance running activities in schools to popularize the sport. From a holistic perspective, balance the promotion and improvement of middle and long-distance running, increase publicity efforts, and promote the sport. Organize school-wide middle and long-distance running events, such as half marathons and 10-kilometer races, to engage all students, allow them to experience the charm of middle and long-distance running, and foster a love for the sport, ultimately achieving the goal of improvement.

4.3. Improving the Management Level of Middle and Long Distance Running Teams

To improve the management system of sports projects and enhance the scientific and systematic nature of middle and long-distance running training. To refine the mechanisms for talent selection, training, competition, and competitive sports management, with each step strictly controlled; to balance training and recovery, focusing on athletes' physical health, actively adopting effective training methods to prevent injuries, conducting regular medical supervision, and providing dietary guidance; to use effective scientific diagnosis and reliable quantitative indicators as key references for setting training plans, determining goals, and arranging loads; to strengthen the supervision of the training process, offering timely guidance and adjustments; to increase the intensity of training, alternating between high-intensity and low-intensity sessions, balancing basic and specialized skills for coordinated development; to regularly assess athletes' performance, continuously adjust training goals, and ensure their achievement.

4.4. Improving the Venues and Facilities for Middle and Long Distance Running Projects

Based on the campus's facilities and guided by the theory of sports clusters, integrate with other sports to share infrastructure and enhance training conditions. Considering the university's location, utilize nearby plateau training bases and mountainous areas to improve athletes' training conditions. Make full use of the campus environment for various long-distance running activities, and create more training methods by utilizing existing equipment to achieve multiple uses. The school leadership should provide encouragement and support, and purchase sports equipment for middle and long-distance running.

5. Conclusion

The development of middle and long-distance running is a comprehensive project that involves multiple key elements, including the development of teaching staff, the enhancement of athletes' overall qualities, the management of sports teams, and the improvement of venues and facilities. In practice, these elements are interconnected and mutually reinforcing. The professional level of teachers directly impacts the training outcomes of athletes, while the overall quality of athletes determines their competition results. Effective management and well-equipped facilities are the foundational guarantees for all these aspects. Therefore, to achieve comprehensive development in middle and long-distance running, it is essential to address multiple aspects, including teachers, athletes, management mechanisms, and facilities, forming an organic whole that collectively advances the sport.

In the future, we should continue to strengthen the development of middle and long-distance running coaches, enhancing their professional skills and innovative capabilities. We should focus on developing athletes' overall qualities, improving their physical fitness, skills, and mental resilience. We need to refine the management system of sports teams, making training more scientific and systematic. Additionally, we should enhance the construction of venues and facilities to provide better training and competition conditions for athletes. Through these comprehensive measures, we are confident that the middle and long-distance running project will achieve even greater success and make significant contributions to the advancement of sports.

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