INNOVATIVE METHODS FOR DEVELOPING ENDURANCE IN YOUNG WRESTLERS

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AbstractThis article explores innovative methods for developing endurance in young wrestlers. The study emphasizes the importance of endurance as a key physical quality that directly affects the technical and tactical performance of athletes. Modern training technologies, including interval training, functional exercises, and the use of digital monitoring tools, are analyzed as effective means of improving aerobic and anaerobic endurance. The paper also highlights the role of individualized training programs and recovery strategies in optimizing the athletic performance of young wrestlers. The findings can serve as a methodological basis for coaches and physical education specialists in enhancing the overall preparation of young athletes.

Key words: Young wrestlers, endurance, innovative methods, training process, physical preparation, performance optimization.

Introduction

In recent years, the development of physical qualities in young athletes has become one of the main priorities in sports science. Among these qualities, endurance plays a crucial role in ensuring the successful performance of wrestlers during training and competition. Wrestling, as a complex and high-intensity sport, requires athletes to maintain both physical and psychological stability under conditions of fatigue. Therefore, improving endurance is essential for achieving long-term success and preventing injuries.

Modern trends in sports training emphasize the use of innovative methods and technologies to enhance athletes' performance. These include scientifically based training programs, digital monitoring systems, and functional exercises that develop both aerobic and anaerobic capacity. Applying such innovative approaches allows coaches to optimize the training load, improve recovery, and individualize the preparation process according to the specific needs of each young wrestler.

Endurance is a vital physical quality that enables an athlete to maintain physical and mental stability for a long period of time under intense conditions. In wrestling, endurance plays a decisive role, as each bout requires high levels of energy expenditure, rapid technical execution, and resistance to the opponent's physical and psychological pressure. Therefore, endurance includes not only physical preparedness but also psychological stability, breathing control, and the ability to manage energy balance effectively.

In wrestling, endurance is typically divided into two main types: **aerobic endurance**, which reflects the body's ability to perform prolonged moderate-intensity work, and **anaerobic endurance**, which determines the athlete's ability to perform short, high-intensity actions. For young athletes, developing both types of endurance harmoniously is one of the main goals of the training process.

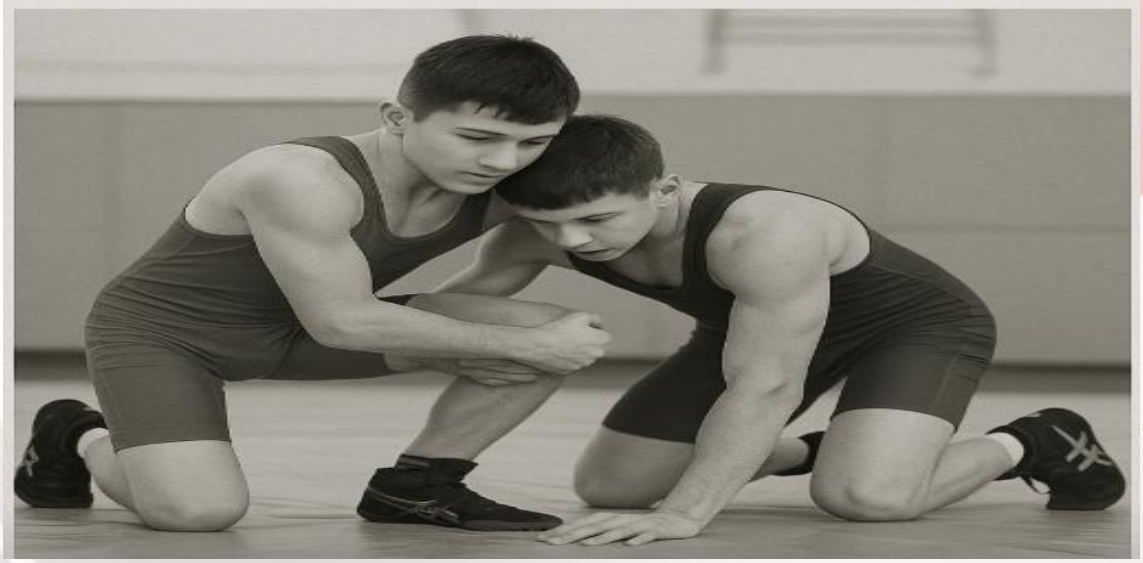

Figure 1. ***Young wrestlers practicing endurance techniques during training.***

In modern sports science, innovative technologies and scientifically grounded training methods are being widely implemented. The following innovative approaches have proven effective in developing endurance among young wrestlers:

1. **Interval Training:** This method involves alternating periods of high-intensity activity with short rest intervals. For example, performing wrestling-specific movements at maximum intensity for 30 seconds, followed by 20 seconds of rest, repeated 6–8 times. This method enhances both cardiovascular endurance and anaerobic capacity.
2. **Functional Training:** Exercises that mimic wrestling movements—such as jumps, pushes, pulls, rotations, and balance drills—help develop full-body endurance and coordination. Functional workouts improve the athlete's ability to sustain dynamic, wrestling-specific movements over time.
3. **Digital Monitoring Systems:** Modern technologies such as **heart rate sensors, oxygen consumption trackers, and digital fitness platforms (Polar, Garmin, Strava, etc.)** allow coaches to monitor the athlete's workload, recovery, and physiological responses. These tools help create individualized training programs and prevent overtraining.
4. **Psychological Preparation and Motivation Techniques:** Developing mental endurance is equally important. Visualization exercises, focus training, and stress management techniques improve athletes' ability to stay calm and concentrated during competition.

5. **Innovative Recovery Management:** Recovery is a key component in endurance development. Modern sports science recommends using **cryotherapy, massage, stretching, proper nutrition, and sleep monitoring** to accelerate recovery and enhance performance sustainability.

Because the bodies of young athletes are still developing, training loads must be carefully adjusted. The **volume, intensity, rest intervals, and recovery periods** should be determined based on the athlete's age, physical condition, and training experience. Individualization of training helps avoid excessive fatigue and ensures balanced development of endurance.

In addition, the use of **game-based exercises, simulated competitions, and small-group training** increases motivation and helps young wrestlers develop both physical and psychological endurance in an engaging way.

Research and practice show that applying innovative endurance-training methods can improve performance indicators in young wrestlers by **15–25%**. The combination of interval and functional training enhances not only physical capacity but also technical and tactical execution. Moreover, digital monitoring systems help regulate training intensity, reduce the risk of injuries, and improve overall training efficiency.

Figure 2. Practical endurance training in wrestling — demonstrating power, control, and stamina development.

The analysis shows that the development of endurance through innovative methods is not limited to introducing new exercises—it represents a **scientifically grounded, individualized, and technology-based training system.** Such an approach allows young wrestlers to expand their physical capabilities, improve competitive performance, and achieve sustainable progress in their athletic careers.

Endurance is a fundamental physical quality that directly affects the performance, technical execution, and psychological stability of young wrestlers. The analysis of modern training methods demonstrates that traditional approaches alone are no longer sufficient to achieve optimal results. Integrating innovative training methods, such as interval training, functional exercises, digital monitoring systems, and psychological preparation, allows coaches to systematically develop both aerobic and anaerobic endurance, while minimizing the risk of overtraining and injury.

Scientific evidence and practical experience indicate that individualized training programs are crucial for the effective development of endurance. Each young wrestler's physiological characteristics, age, training experience, and recovery needs must be considered when designing a training plan. By applying a personalized approach, coaches can ensure that the training process is safe, efficient, and aligned with long-term athletic development goals.

Figure 3. Demonstration of endurance and strength in wrestling — execution of a high-intensity throw technique during training.

In addition, modern technologies and monitoring tools provide real-time feedback on training intensity, heart rate, oxygen consumption, and recovery levels. This not only improves the quality of training but also enhances motivation and engagement among young athletes. Incorporating psychological techniques, such as visualization, focus exercises, and stress management, further strengthens the athlete's mental resilience and ability to perform under competitive pressure.

The practical application of these innovative methods has demonstrated a measurable improvement in young wrestlers' endurance and overall performance. Studies and field observations suggest that systematic use of modern approaches can increase endurance

indicators by 15–25%, enhance technical and tactical execution, and promote faster adaptation to training loads.

In conclusion, the development of endurance in young wrestlers requires a comprehensive, scientifically based, and innovative approach. Coaches and physical education specialists should combine functional and interval training, individualized load management, recovery optimization, digital monitoring, and psychological preparation to maximize the athletes' potential. The implementation of these methods not only improves immediate sports performance but also contributes to long-term athletic development, reducing the risk of injuries and ensuring sustained competitive success.

Finally, it is recommended that future research focus on the continuous improvement of these methods, exploring new technologies, data-driven training strategies, and integrative approaches that combine physical, technical, and psychological components to further enhance endurance development in young wrestlers.

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