

Model of Long-Term Improvement for the Efficiency of the Training Process in Greco-Roman Wrestling: Physiological, Psychological, and Technical Aspects, Individualization of Training

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Abstract

This article is dedicated to the study of long-term training methods for Greco-Roman wrestlers, focusing on the individualization of training and consideration of physiological, psychological, and technical-tactical parameters. The article presents a model of long-term improvement in the training process, taking into account the individual characteristics of athletes at different stages of their development. The stages of wrestlers' development from adolescence are examined, and methodologies adapted to anthropometric and psychophysiological characteristics are proposed. Particular attention is paid to a comprehensive approach that includes strength, endurance, and coordination development, injury prevention, and optimization of training loads considering the specifics of Greco-Roman wrestling. Coaches must consider each athlete's individual characteristics, such as their physical and psychological readiness level, to prevent injuries and burnout. Individualized training programs help improve preparation efficiency and develop technical-tactical skills crucial for successful competition performances. The proposed model of long-term improvement contributes to maintaining stable results at high-level competitions and ensuring the harmonious development of athletes in the long term.

Keywords: *Greco-Roman wrestling, long-term development model, individualization of training, technical-tactical mastery, psychological preparation.*

Introduction. Greco-Roman wrestling requires athletes to have a high level of physical and technical-tactical training as well as psychological resilience. Wrestlers develop through several key stages, starting from adolescence and continuing into maturity. To achieve high results, coaches must consider an athlete's individual characteristics: anthropometric data, physical, and psychological readiness levels. Modern wrestling training methodologies involve a comprehensive approach that helps balance strength, endurance, and coordination development while simultaneously improving technical-tactical skills. An essential aspect of preparation is the long-term development model, which adapts training processes according to athletes' age and individual characteristics at each stage of their sports careers. Proper load distribution

and the use of recovery measures become key factors in preventing burnout and injuries in young athletes, promoting their long-term success and harmonious development.

Objective of the Study was to develop a long-term development model for Greco-Roman wrestling that focuses on individualization, integrating physiological, psychological, and technical aspects to optimize performance, prevent injuries, and support sustained athlete development.

Methods and Research Organization. The study involved 17 Greco-Roman wrestlers aged 9 to 22, who were under my pedagogical supervision for more than 10 years. The observation covered their entire training journey, from the initial stage to achieving a professional level, including selection for the national team



and winning titles at major international competitions. Methods used included anthropometric measurements, physical fitness testing, technical-tactical skill analysis, psychological readiness diagnostics, and literature analysis.

Results and Discussion. One of the key strategies for long-term wrestler training is the use of a multi-level development system, which allows training to be adapted at each stage of an athlete's growth. The foundation of this model is the concept of "Long-Term Athlete Development" (LTAD), which is widely used in various sports to ensure consistent and harmonious athlete growth [1, 4]. However, based on years of coaching experience in Greco-Roman wrestling, this concept has been adapted to reflect the specifics of this sport, including unique requirements for strength training, technical-tactical mastery, psychological resilience, and injury prevention. The adapted LTAD model for Greco-Roman wrestling also considers the sport's characteristics, such as high contact and injury risk, necessitating a focus on coordination, flexibility, and general physical preparedness at early stages.

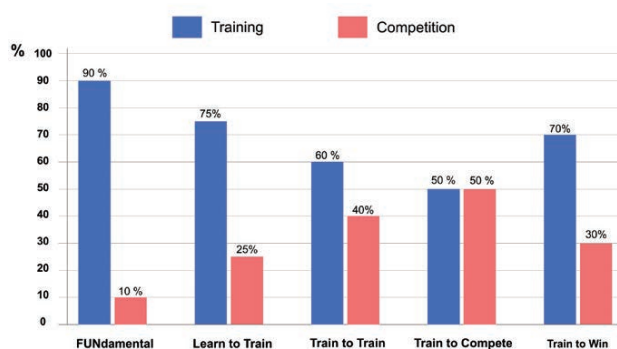


Fig. 1. Stages of Long-Term Sports Training Development in Greco-Roman Wrestling

1) FUNDamental (6-9 years): At this stage, the main focus is on developing basic motor skills such as running, jumping, throwing, and other elements. Training is conducted through play-based methods, making the process engaging and fostering children's interest. Games not only develop physical literacy but also maintain a high level of motivation, forming a positive attitude toward training and a healthy lifestyle. This stage also contributes to overall physical fitness, which is crucial for mastering more complex sports skills in the future [2, 6].

2) Learning to Train (9-12 years): At this stage, specialized training is introduced to develop wrestling skills and strengthen the muscular framework, tak-

ing into account the individual characteristics of athletes. The "window of accelerated adaptation" begins, where children develop general sports skills essential for further progress. It is important to refine motor skills by improving coordination, flexibility, endurance, and speed [1, 4].

3) Train to Train (12-16 years): At this stage, the focus is on technical and tactical training, endurance, and strength development. Athletes master complex wrestling techniques, body control, and tactical thinking. It is crucial to monitor progress, implement recovery procedures, and consider individual characteristics. Together with the coach, a match plan is developed to effectively control the situation on the mat [3, 8]. Psychological preparation is of key importance—managing emotions and maintaining composure in stressful situations.

4) Train to Compete (16-23+ years): At this stage, athletes focus on competition preparation, enhancing strength and technical-tactical skills. Training becomes more individualized, addressing each wrestler's strengths and weaknesses [2, 3, 7]. Opponent analysis through video helps in developing match strategies, considering possible scenarios, and anticipating the opponent's moves. Simulating competitive situations aids in adapting to combat conditions and stress. Physical training emphasizes aerobic endurance, strength, and speed, while psychological preparation focuses on emotional control and decision-making under pressure. Preventive breaks are included to avoid burnout and injuries [1, 6].

5) Training to Win (18+ years): This is the stage when athletes reach their peak physical and psychological form. The primary focus now shifts to maximizing results. Training programs become highly personalized, considering all aspects: physical, technical, tactical, and psychological preparation [2, 3, 4]. Athletes learn to manage their inner state, form a clear wrestling strategy, and impose their own fighting style, controlling pace and tactics. Training sessions are high in intensity and volume, including competition simulations, performance analysis, and strategy planning for specific opponents. Planned recovery periods are used to prevent physical and mental burnout [5].

Throughout the stages of long-term development in Greco-Roman wrestling, the recommended training-to-competition ratio evolves. Early stages, like the FUNDamental stage, focus on training (e.g., 90:10), with competition gradually increasing. By the 'Train to Compete' stage, it balances at 50:50, combining skill

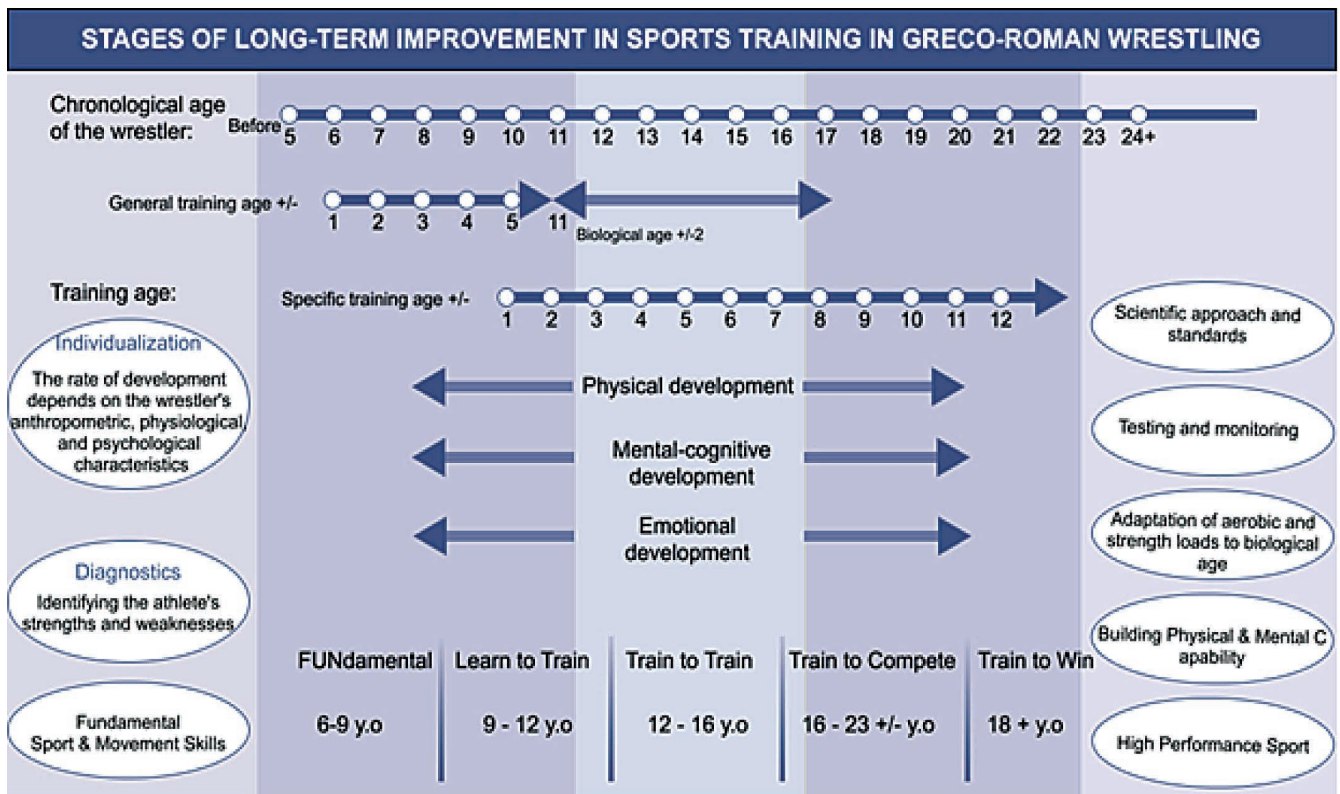


Fig. 2. Training-to-Competition Ratio at Different Stages of LTAD in Greco-Roman Wrestling

and competition preparation. At the highest level, the 'Train to Win' phase shifts to 70:30, prioritizing performance while maintaining a strong foundation. During individualization, the ratio may be adjusted based on the athlete's needs and development [1, 4, 5].

Individualization of the Training Process. An individualized approach in Greco-Roman wrestling is based on athletes' anthropometric, physiological, and psychological data. Analyzing height, weight, limb length, and body composition helps adjust training loads, optimize technical and tactical strategies, and improve overall training efficiency [2, 6].

Technical and Tactical Skills. As athletes mature, the development of technical and tactical skills progresses, with increasing demands on speed, precision, and automation of tactical combinations. Considering individual physiological characteristics—such as strength, endurance, and coordination—contributes to more effective skill enhancement [7].

Psychological Preparation. Psychological resilience plays a key role in a wrestler's competitive success. Athletes must develop concentration, manage emotions, and cope with stress [5, 8]. Psychological preparation methods include:

- 1) Meditation and breathing exercises to reduce anxiety.
- 2) Motivational discussions to maintain fighting spirit.
- 3) Goal-setting techniques to improve focus.

Prevention of Early Specialization and Burnout. Excessive training loads at an early age without proper recovery lead to burnout and injuries. Neglecting long-term development stages decreases motivation and increases the risk of exhaustion [4, 3]. The main causes of burnout include excessive workloads, lack of psychological support, and the absence of structured training periodization. Balancing training and rest is the key factor in burnout prevention. Recovery methods include massage, physiotherapy, and sauna sessions [2, 6, 8].

Injury Prevention. To reduce injury risks, it is crucial to strengthen vulnerable areas. Statodynamic exercises with dumbbells and resistance bands, stretching, and working in different ranges of motion with light weights reduce the risk of injuries and improve physical conditioning. A diverse training regimen—including gymnastics, track and field activities, and coordination exercises—at early training stages lays a solid foundation for the long-term development of wrestlers [3, 7].



Conclusion. Research results indicate that implementing a long-term development model and an individualized training methodology for Greco-Roman wrestlers over more than ten years has led to significant progress. This includes athletes achieving the title of Master of Sport, joining the national team, and winning top places in prestigious national and international competitions. The introduction of this training model has significantly improved physical conditioning, technical and tactical skills, and psychological resilience. Considering individual characteristics—such as anthropometric data, physical testing, and psychological readiness—allowed for training load optimization, which in turn enhanced performance. The structured age-based training stages provided optimal conditions for athlete development at each phase. These achievements confirm the high effectiveness of the proposed model, which fosters sustainable athletic progress, reduces injury risks, and improves stress tolerance. This methodology can be beneficial for training wrestlers across different age and skill groups, as well as for further scientific research on individualized approaches in Greco-Roman wrestling.

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