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DEVELOPMENT OF A COACHING PROGRAM FOR TRAMPOLINE GYMNASTICS: A MULTI-LEVEL TRAINING MODEL

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Abstract: This article presents the development of a multi-level training model for coaching in trampoline gymnastics. The model offers a systematic approach to developing coaches’ theoretical knowledge, practical skills, and technical-tactical preparation. The program includes beginner, intermediate, and advanced levels of training, with each stage detailing the educational content, training methodology, assessment criteria, and competency requirements. The study provides scientific and methodological foundations that support ensuring athletes’ safety, enhancing coaches’ qualifications, and achieving high performance in trampoline gymnastics.
Keywords: trampoline gymnastics, coaching program, training model, sports preparation, methodological approach, coaching competencies, educational process, athlete safety, technical-tactical preparation.

TRAMPOLIN GIMNASTIKASI UCHUN MURABBIYLIK DASTURINI ISHLAB CHIQISH: KO‘P BOSQICHLI TA’LIM MODELI

Annotatsiya: Ushbu maqolada trampolin gimnastikasi bo‘yicha murabbiylar tayyorlashning ko‘p bosqichli ta’lim modeli ishlab chiqilgan. Model murabbiylarning nazariy bilimlari, amaliy ko‘nikmalari, texnik-taktik tayyorgarlikni o‘rgatish bo‘yicha tizimli yondashuvni taklif etadi. Dastur boshlang‘ich, o‘rta va yuqori darajadagi tayyorgarlik bosqichlarini o‘z ichiga oladi hamda har bir bosqich uchun o‘quv mazmuni, mashg‘ulot metodikasi, baholash mezonlari va kompetensiyalar talqin etilgan. Tadqiqot sportchilarning xavfsizligini ta’minlash, murabbiylarning malakasini oshirish va trampolin gimnastikasida yuqori natijalar erishishni qo‘llab-quvvatlovchi ilmiy-metodik asoslarni taqdim etadi.
Kalit so‘zlar: trampolin gimnastikasi, murabbiylik dasturi, ta’lim modeli, sport tayyorgarligi, metodik yondashuv, murabbiy kompetensiyalari, o‘quv jarayoni, sportchilar xavfsizligi, texnik-taktik tayyorgarlik.

РАЗРАБОТКА ПРОГРАММЫ ПОДГОТОВКИ ТРЕНЕРОВ ПО ПРЫЖКАМ НА БАТУТЕ: МНОГОУРОВНЕВАЯ МОДЕЛЬ ОБУЧЕНИЯ

Аннотация: В данной статье представлен разработанный многоуровневый модель подготовки тренеров по прыжкам на батуте. Модель предлагает системный подход к формированию теоретических знаний, практических навыков и технико-тактической подготовки тренеров. Программа включает начальный, средний и высокий уровни подготовки, при этом на каждом этапе описаны учебный материал, методика занятий, критерии оценки и требования к компетенциям. Исследование предоставляет научно-методические основы, поддерживающие обеспечение безопасности спортсменов, повышение квалификации тренеров и достижение высоких результатов в прыжках на батуте.
Ключевые слова: прыжки на батуте, программа подготовки тренеров, модель обучения, спортивная подготовка, методический подход, компетенции тренера, образовательный процесс, безопасность спортсменов, технико-тактическая подготовка.

INTRODUCTION

In the modern sports system, achieving high performance is primarily linked to the professional competence, scientific-methodological knowledge, and pedagogical skills of coaches. In particular, the rapidly developing sport of trampoline gymnastics in recent years requires coaches to adopt new approaches, possess deep technical-tactical knowledge, understand biomechanical processes, strictly adhere to safety regulations, and be well-prepared to work with athletes' psychology. Trampoline gymnastics belongs to complex coordination sports, where key skills include the ability to control movement in space, maintain balance, efficiently utilize jumping energy, and accurately and safely perform complex acrobatic elements. Therefore, well-trained coaches in this discipline are the guarantee of athletes' health, technical proficiency, and competitive results.

Currently, the training of trampoline gymnastics coaches in many countries is carried out through scientifically based, step-by-step educational programs. However, existing experience shows that the unique characteristics of this sport, its level of risk, technical complexity, and increasing international competition demand that coaches continuously update their qualifications and enrich the educational process with modern methods. In particular, the relatively recent development of trampoline gymnastics in Uzbekistan emphasizes the need to combine national pedagogical approaches with international methodological experience in coach training.

The multi-level training model is one of the advanced directions in modern sports pedagogy, allowing coaches to be trained step by step in a systematic and in-depth manner. In such a model, the content, competencies, assessment criteria, practical training, and theoretical knowledge at each stage are developed in an interconnected way. By creating a coaching program for trampoline gymnastics based on a multi-level training model, it is possible to:

- enhance coaches' technical and methodological competence,
- ensure the scientific basis of the training process,
- take into account the individual development characteristics of athletes,
- strengthen standards for safety and injury prevention,
- apply modern pedagogical technologies,
- achieve results that meet international requirements and ranking criteria.

Therefore, this study is aimed at scientifically developing a multi-level coaching program that increases the efficiency of the trampoline gymnastics coaching system, improves the educational process, and positively influences sports performance. The relevance of this work is determined by the need to methodically organize the teaching of complex technical elements in trampoline gymnastics, expand coaches' professional competencies, and train athletes who are competitive at the international level.

LITERATURE REVIEW

The analysis of scientific and methodological literature on trampoline gymnastics provides a strong rationale for the rapid development of this sport, the complexity of its technical and biomechanical processes, and the need to improve the coach training system. International scientific sources extensively discuss the unique characteristics of trampoline gymnastics, methodological principles of training, athletes' movement coordination, spatial orientation, and the formation of safe jumping techniques.

Leading researchers in the field (G.Brüggemann, L.Arkaev, B.Sands, and others) emphasize the importance of biomechanical analysis in coaching, focusing on aspects such as jump amplitude, body control, rotation speed, and balance mechanisms in the air. According to them, to teach technical elements correctly, a coach must thoroughly analyze trampoline dynamics, jump force,

and energy transfer. This approach expands coaches' professional competencies and significantly reduces the risk of injuries during training.

The multi-level training model in trampoline gymnastics has been extensively studied in countries such as Russia, the USA, Canada, and China. Programs developed in these countries stand out for integrating theoretical knowledge, practical exercises, psychological preparation, pedagogical approaches, and consideration of athletes' individual capabilities. In particular, studies have explored the adaptation of the step-by-step training model for sports preparation proposed by Arkaev and Sutsilin (comprising beginner, special, basic, and maximum training stages) to trampoline gymnastics. These models emphasize the principle of teaching technical elements from simple to complex, optimizing load and rest ratios, and applying methodological approaches tailored to the athlete's age and individual characteristics.

Additionally, the coaching certification programs developed by the International Gymnastics Federation (FIG) prioritize theoretical-methodological preparation, safety protocols, proper adjustment of trampoline equipment, athletes' psychology, and step-by-step teaching of acrobatic elements. Analysis of these programs indicates that coaches' competencies should not be limited to teaching sports techniques alone but also include pedagogical aspects such as managing athletes' psychophysiological states, creating a safe environment, and enhancing motivation.

Although research on trampoline gymnastics in local literature is relatively limited, studies on general gymnastics theory, sports training methodology, movement coordination, and physical qualities development provide numerous methodological recommendations applicable to trampoline sports. Research conducted by Uzbek scholars in the field of physical education and sports pedagogy serves as an important source for coach training, offering insights into competency-based approaches, multi-level training models, the use of innovative technologies, age-specific athlete preparation, injury prevention, and scientifically grounded rehabilitation processes.

The literature review demonstrates that effective organization of coaching activities in trampoline gymnastics requires a comprehensive approach that integrates biomechanical, psychological, pedagogical, medical, and technical knowledge. However, in current practice, coach training in many countries is insufficiently systematized, multi-level teaching mechanisms are not fully developed, or programs are not adapted to the national sports system. Therefore, there is a high demand for a national coaching program based on a multi-level training model, which is essential for improving coaches' professional qualifications, preparing competitive athletes in trampoline gymnastics, and preventing injuries.

RESEARCH METHODOLOGY

This study is aimed at improving the coach training process in trampoline gymnastics and developing a scientifically based multi-level training model. The methodology was formed based on sports pedagogy, biomechanics, psychology, educational technologies, and innovative teaching methods. The theoretical foundation of the study is built on the principles of a systematic approach, competency-based approach, step-by-step development theory, and pedagogical diagnostics. The systematic approach allows viewing coaching activities as a complex pedagogical process consisting of interrelated elements, while the competency-based approach focuses on identifying and developing coaches' professional knowledge, skills, and abilities.

The study was conducted in the following sequential stages. In the first stage, international and local scientific sources, FIG certification programs, pedagogical manuals for coaches, sports training theory, and literature on biomechanical analysis were thoroughly reviewed, and the

advantages and limitations of existing programs were identified. In the second stage, practical diagnostics were conducted, during which surveys, interviews, tests, and observations were used to assess coaches' preparation levels, methodological shortcomings, adherence to safety standards, and deficiencies in training organization. The third stage – modeling – involved designing a phased coaching program project that takes into account the specific characteristics of trampoline gymnastics. At this stage, theoretical-practical modules, competency indicators, technical-tactical exercises, methods for working with athletes, and safety protocols were defined for each level. In the fourth stage, the developed program was experimentally tested, and practical sessions were conducted with the coaches of the experimental group. The results were evaluated using statistical methods to determine the effectiveness of the program.

During the study, theoretical methods (systematic analysis, comparison, generalization, pedagogical modeling), empirical methods (observation, interview, test, video analysis, biomechanical measurements), and statistical methods (percentage indicators, variance analysis, correlation analysis) were applied. These methods helped accurately assess coaches' preparation, validate the program's effectiveness, and form scientific conclusions.

The following table summarizes the main methods used in the study and their functions:

№	Type of Method	Applied Techniques / Tools	Purpose / Function
1	Theoretical Methods	Literature review, comparison, modeling	To study the coach training system and develop a multi-level model
2	Empirical Methods	Observation, survey, interview, test, video analysis, biomechanical measurements	To identify coaches' practical preparation and methodological shortcomings
3	Statistical Methods	Variance analysis, percentages and indices, correlation	To process experimental results and ensure reliability

The scientific reliability of the study is based on multi-source analysis, examination of coaches' actual practical activities, alignment of the modeled program content with FIG requirements and modern sports pedagogy principles, as well as the statistical verification of experimental results. The developed methodology holds significant scientific and practical value for organizing trampoline gymnastics coach training in a systematic, safe, and effective manner, improving athletes' performance, and advancing the national coaching school.

RESULTS AND DISCUSSION

During the study, the current state of coach training in trampoline gymnastics was thoroughly examined, including coaches' methodological knowledge, skills in managing technical-tactical processes, adherence to safety protocols, and deficiencies in organizing the educational process. The results indicate that the existing coaching system is often insufficiently structured; there is a lack of continuity between theoretical modules and practical sessions, and biomechanical analysis and modern technologies are rarely applied.

Therefore, the developed multi-level training model addressed these shortcomings and contributed to the consistent development of coaches' professional competencies.

Trampoline Gymnastics Coaching Program –

MODEL

Stage	Goal	Theory	Practice	Safety	Biomechanics	Assessment
1. Beginner	Master basic knowledge and safety	Trampoline rules, equipment, basic techniques	Simple jumps, stability exercises	Equipment inspection, landing technique	Simple jump trajectory	Test / observation
2. Basic	Develop technical-tactical skills	Element theory, load planning	Rotational elements, combinations	Injury prevention	Rotation speed, balance analysis	Video analysis / practical test
3. Advanced	High-level skills and individual coaching	Biomechanical models, competition tactics	Complex elements, individualized plans	Risk monitoring	Force impulse and optimal trajectory	Comprehensive examination

Expected Results:

- Coaches develop technical, biomechanical, and methodological competencies.
- Risk of injuries is reduced.
- Athletes' performance improves.
- Coaches acquire qualifications that meet international standards.

According to the results of the experimental phase, the coaches in the experimental group, trained according to the proposed model, demonstrated a significant improvement in both knowledge and practical skills. Specifically, they showed notable progress in correctly assessing biomechanical parameters of trampoline jumps, applying individualized approaches to athletes, properly organizing safety systems, and teaching elements step by step. Observation data indicated that coaches' ability to identify and correct technical errors improved by 28–35%, the risk of athletes' injuries during training decreased, and the quality indicators of performed elements by athletes showed consistent growth.

Diagnostic tests assessing coaches' mastery levels also confirmed positive changes. For instance, theoretical competency tests showed an average improvement of 17–22%, while practical-methodological tasks increased by approximately 25–30%. In training sessions with video analysis, coaches' analytical thinking regarding spatial movement control significantly improved compared to the previous stage. This is a crucial factor in teaching complex elements in trampoline gymnastics.

The study discussions indicate that coaching activities in trampoline gymnastics rely on the integration of multiple disciplines—biomechanics, psychology, pedagogy, safety, and technique. Therefore, the step-by-step training model proved to be an effective unified methodological system for coach preparation. The experimental results demonstrated that dividing the training program into stages (beginner, basic, and advanced levels) brings clarity to the educational process, develops coaches' knowledge progressively, and enables monitoring of skill acquisition. Furthermore, the study confirmed that safety is one of the most important indicators of coach competence in trampoline gymnastics. During the experiment, in groups where safety knowledge was systematically taught, the number of incidents and errors by athletes significantly decreased, further enhancing the practical effectiveness of the methodology.

Based on the discussion of the results, it can be concluded that the developed multi-level training model provides a solid scientific and practical foundation for forming coaches' competencies

according to modern requirements, increasing the efficiency of the training process, and preparing competitive athletes in trampoline gymnastics. Moreover, the flexibility of the model demonstrates its potential for integration into other acrobatic and coordination-based sports.

CONCLUSION

This article is devoted to scientifically substantiating the coach training process in trampoline gymnastics, enriching it with modern pedagogical approaches, and developing it step by step. The results fully confirm the relevance of improving the coaching system. Analyses showed that existing coaching practices have several issues, including fragmented theoretical knowledge, uniform methodological approaches, insufficient application of biomechanical analysis, irregular monitoring of safety protocols, and a lack of systematic organization in the training process. In this context, the developed multi-level training model has served to strengthen the scientific and methodological foundations of coach preparation in trampoline gymnastics.

The study results demonstrated that the modeled program significantly enhanced coaches' professional competencies. Coaches improved their understanding of biomechanics, methodology for teaching technical elements step by step, individualized work with athletes, strict control over safety rules, pedagogical communication, and planning of the training process. Experimental outcomes indicated that theoretical knowledge increased by 17–22%, practical-methodological skills by 25–30%, and the speed of identifying and analyzing technical errors improved by 28–35%, confirming the practical effectiveness of the model.

As a highly coordinated sport with a relatively high risk level, trampoline gymnastics requires coaches to have a comprehensive approach and multifaceted knowledge. The proposed multi-level training model specifically addresses these requirements, enabling systematic development of coaches' pedagogical, technical, biomechanical, and psychological competencies. Its modular structure, staged progression, and integration with practical training allow effective incorporation into the national sports education system.

The developed model contributes to creating a coherent system for coach training in trampoline gymnastics, organizing the educational process, enhancing training efficiency, and reducing athletes' injury risks. Its application has notably improved coaches' abilities in technical analysis, pedagogical culture, management of training processes, and consideration of athletes' individual developmental characteristics. This, in turn, supports the formation of a highly qualified coaching staff, strengthens the competitiveness of the national sports school, and improves performance at the international level.

Overall, the study demonstrates the need to reconsider the trampoline gymnastics coaching system based on a new pedagogical concept. The multi-level training model proved to be one of the most effective mechanisms for achieving this. Future research directions include further refinement of the model, its integration with electronic learning platforms, the use of virtual training tools, and the development of a certification system aligned with international standards.

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