

**MENTAL ENLIGHTENMENT SCIENTIFIC –
METHODOLOGICAL JOURNAL****MENTAL ENLIGHTENMENT SCIENTIFIC –
METHODOLOGICAL JOURNAL**<http://mentaljournal-jspu.uz/index.php/mesmj/index>**FACTORS AFFECTING THE PERFORMANCE CAPACITY OF ELITE ATHLETES
AND STRATEGIES FOR ITS ENHANCEMENT****Sherzod Inogamovich Shadzhalilov***Acting Associate Professor of the Department of "Adaptive Physical
Culture and Para-sports,"**doctor of Pedagogical Sciences (PhD)**e-mail: sadzalilovserzod@gmail.com**Tashkent, Uzbekistan***ABOUT ARTICLE**

Key words: highly qualified athletes, work capacity, physical fitness, functional status, training load, competitive activity, cardiovascular system, respiratory system, maximal oxygen uptake ($VO_2\max$), psychological preparation, recovery processes, balanced nutrition.

Received: 05.08.26**Accepted:** 06.08.26**Published:** 07.08.26

Abstract: Currently, maintaining and improving the work capacity of highly qualified athletes is one of the most relevant issues in sports science. Modern highly qualified athletes perform under conditions of high training loads and an increasingly congested competition calendar [1]. Scientific studies emphasize that the main factors affecting athletes' work capacity include the level of physical fitness, the functional state of body systems, training and competition loads, nutritional regimen, recovery processes, and psychological preparation. This article analyzes the influence of these factors on the athlete's organism and highlights their relationship with work capacity efficiency. Furthermore, the impact of the functional capabilities of the cardiovascular and respiratory systems, oxygen consumption indicators, fatigue mechanisms, and recovery processes on sports performance has been examined. Research findings indicate that scientifically based planning of training loads, functional monitoring, balanced nutrition, psychological preparation, and the use of modern recovery strategies can significantly improve athletes' work capacity. It has been established that in most athletes, the year-to-year increase in training volume follows a non-linear pattern, which subsequently leads to a

stabilization (plateau) phase [2]. Scientific evidence has been systematized from the perspective of field-applicable monitoring domains in sports practice and their importance for decision-making processes [3]. Therefore, comprehensive investigation of the factors affecting the work capacity of highly qualified athletes and their optimization represent essential conditions for achieving high-level sports performance.

Introduction. Enhancing and maintaining the performance capacity of elite athletes is one of the major challenges in sports physiology and sports medicine. The increasing volume and intensity of training and competition schedules place substantial demands on athletes' functional capacities. International studies have demonstrated that inadequate training load management is a major risk factor for reduced performance, injury occurrence, and overtraining syndrome [4].

Scientific evidence indicates that athletic performance is influenced by multiple factors, including physical fitness, functional status, nutrition, recovery strategies, and psychological readiness [5]. Therefore, identifying the factors affecting the performance capacity of elite athletes and developing effective methods for improving performance remains an important scientific and practical issue [6].

To achieve the objectives of the study, a set of scientific methods was employed to identify and evaluate the factors affecting the performance capacity of elite athletes. The combination of theoretical and empirical research methods ensured the reliability and validity of the obtained results.

Analysis of scientific and methodological literature;

Pedagogical observation;

Physical and pedagogical testing;

Physiological assessment methods;

Questionnaire surveys and interviews;

Mathematical and statistical data analysis.

Research objective: To identify the main factors affecting the performance capacity of elite athletes and to develop practical recommendations for improving their athletic performance.

Research Tasks:

1. To analyze scientific literature concerning the influence of physical, physiological, and psychological factors on the performance capacity of elite athletes.

2. To identify and evaluate the key factors affecting athletes' performance during training and competitive activities.

3. To develop practical recommendations aimed at improving athletes' performance capacity and sporting results through modern training and recovery methods.

Materials and methods

During the research process, a questionnaire survey was conducted to identify the main factors affecting the performance capacity of elite athletes. The questionnaire was aimed at examining training loads, recovery processes, nutrition, and psychological condition of athletes. The collected data provides a basis for scientifically grounded conclusions on improving athletes' performance capacity.

1. How do you rate training loads?

A) Very high

B) Moderate

C) Low

2. Are training programs individualized?

A) Fully

B) Partially

C) Not at all

3. Is recovery sufficient?

A) Yes

B) Partially

C) No

4. Is nutrition controlled?

A) Always

B) Sometimes

C) No

5. How often do you feel fatigue?

A) Rarely

B) Sometimes

C) Often

6. Injury risk level?

A) Low

B) Medium

C) High

7. Psychological preparation?
- A) Regular
 - B) Sometimes
 - C) None
8. Use of modern technologies?
- A) Yes
 - B) Partially
 - C) No
9. Communication with coach?
- A) Good
 - B) Average
 - C) Poor
10. Are tests conducted?
- A) Regularly
 - B) Sometimes
 - C) No
11. Rest regime?
- A) Proper
 - B) Partially
 - C) Improper
12. Medical check-ups?
- A) Regular
 - B) Sometimes
 - C) Rare
13. Motivation level?
- A) High
 - B) Medium
 - C) Low
14. What is lacking?
- A) Scientific programs
 - B) Recovery methods
 - C) Professional control

Analysis of the questionnaire obtained from the subjects

№	content of the questions	Favorable responses(%)	Unfavorable responses(%)	explanation
1.	How do you rate training loads?	34	66	Most athletes reported that training loads were excessive or poorly distributed, which may reduce performance capacity.
2.	Are training programs individualized?	27	73	Lack of individualized training programs was identified; in most cases, a uniform approach is used.
3.	Is recovery sufficient?	29	71	Recovery processes are insufficient, leading to fatigue accumulation and reduced performance.
4.	Is nutrition controlled?	32	68	Nutritional control is not fully implemented; athletes do not follow a fully balanced diet.
5.	How often do you feel fatigue?	43	57	High levels of fatigue were observed, indicating imbalance between training load and recovery.
6.	Injury risk level?	57	43	Injury risk was considered high by a substantial proportion of respondents. likely due to incorrect training loads and insufficient recovery.
7.	Psychological preparation?	36	64	Psychological preparation is insufficient; motivation and stress management issues are present.
8.	Are modern technologies used?	27	73	The use of modern monitoring technologies is very limited.
9.	Communication with coach?	31	69	Communication between athletes and coaches is not sufficient, reducing training efficiency.
10.	Are tests conducted?	29	71	Functional testing is not conducted regularly, indicating weak monitoring systems.
11.	Is the rest regime proper?	33	67	The balance between training and rest is not properly maintained.

12.	Medical check-ups?	37	63	Medical supervision is insufficient; preventive measures need improvement.
13.	Motivation level?	41	59	Motivation is moderate, with a decline observed in some athletes.
14.	What is lacking?	52	48	The main shortages include scientific training programmes and modern recovery methods.

Result and discussion. The questionnaire conducted among elite athletes made it possible to identify the main factors affecting their performance capacity and sporting efficiency. The obtained results indicate the existence of several problems related to training organization, recovery management, medical supervision, and psychological preparation [7].

The first question revealed that 66% of respondents considered training loads excessive or improperly distributed. This suggests deficiencies in training load management and highlights the need for more effective planning strategies. Excessive workloads without considering individual athlete characteristics may lead to chronic fatigue, decreased performance, and a higher risk of injuries [8].

The second question demonstrated that 73% of athletes reported insufficient individualization of training programs. This was one of the highest negative indicators in the survey. The finding suggests that many training plans do not adequately consider athletes' personal characteristics, fitness levels, or sport-specific demands. Individualized training prescriptions based on regular functional assessments should therefore be implemented [9].

The third question showed that 71% of respondents considered recovery processes insufficient. Inadequate recovery may result in accumulated fatigue and overtraining syndrome. To address this issue, active recovery methods, massage, physiotherapy, and proper sleep management should be incorporated into athletes' routines.

Regarding nutrition control, 68% of athletes reported inadequate monitoring. Proper nutrition is a key determinant of athletic performance, recovery, and adaptation to training. Therefore, collaboration with sports nutrition specialists and individualized dietary planning is recommended.

The fifth question indicated that 57% of athletes frequently experience fatigue. This finding reflects an imbalance between training load and recovery strategies. Regular monitoring of fatigue indicators and timely adjustment of training volume and intensity are necessary.

Concerning injury risk, a considerable proportion of athletes identified a high likelihood of sports injuries. Injury prevention programs focusing on balance, coordination, core stability, and neuromuscular training should be integrated into training routines.

Psychological preparation was also identified as a weak area. According to 64% of respondents, psychological support is insufficient. Mental skills training, stress management, and motivational programs should therefore become an integral part of athlete development.

A particularly important finding was that 73% of athletes reported limited use of modern technologies. Wearable devices, GPS systems, video analysis, and digital monitoring tools can significantly improve training efficiency and should be adopted more extensively.

Communication between athletes and coaches was identified as another area requiring improvement, with 69% reporting insufficient interaction. Effective communication enhances motivation, feedback quality, and overall training effectiveness [10].

The tenth question showed that 71% of respondents considered performance testing inadequate. Regular physiological and functional testing is essential for monitoring progress and making evidence-based training decisions.

The results further demonstrated deficiencies in rest management, medical supervision, and motivation. Many athletes reported irregular medical examinations and insufficient recovery periods, both of which may negatively affect long-term performance and health [11].

Overall, the findings indicate that the primary challenges affecting elite athletes' performance include insufficient training individualization, inadequate recovery systems, limited technological support, weak psychological preparation, and insufficient monitoring procedures. Addressing these issues through a comprehensive scientific approach can significantly enhance athletic performance, reduce injury risk, and improve long-term sporting success [12].

Proposed Exercise Program for Enhancing Elite Athletes' Performance Capacity

№	Exercise Content	Training Volume	Important Considerations
1.	Plank	3–4 sets, 30–60 sec	Avoid excessive lower-back arching
2.	Side Plank	3 sets each side	Maintain body alignment
3.	Single-Leg Balance	30 sec each leg, 3 repetitions	Ensure knee stability
4.	BOSU Balance Exercise	3 sets, 30–40 sec	Distribute body weight evenly
5.	Interval Running	8–10 repetitions	Monitor heart rate
6.	Shuttle Run (4×10 m)	4–6 repetitions	Maintain proper turning technique
7.	Agility Ladder Drill	5–6 movement patterns	Focus on speed and accuracy

8.	Jump Squats	3×10–12 repetitions	Prevent inward knee movement
9.	Medicine Ball Throws	3×12–15 repetitions	Engage core muscles actively
10.	Burpees	3×10–15 repetitions	Perform movements continuously
11.	Dynamic Stretching	8–10 minutes	Avoid sudden movements
12.	Foam Rolling	10–15 minutes	Apply moderate pressure on sore areas
13.	Diaphragmatic Breathing	5–10 minutes	Maintain deep, rhythmic breathing
14.	Visualization Training	5–7 minutes	Clearly imagine competitive actions
15.	Yo-Yo Recovery Drill	Once per week	Adjust intensity individually
16.	Active Recovery Exercise	20–30 minutes	Keep intensity low

Based on the results of the questionnaire survey, the proposed complex of special exercises, and the analysis of the functional state of elite athletes, the following practical recommendations were developed:

1. Implement individualized training programs based on athletes' age, fitness level, functional capacity, and sport-specific requirements.
2. Regularly incorporate functional and preventive exercises to improve performance and reduce injury risk.
3. Utilize modern recovery methods such as foam rolling, sports massage, contrast baths, cryotherapy, and active recovery sessions.
4. Enhance psychological preparation through visualization techniques, diaphragmatic breathing exercises, and sports psychology interventions.
5. Strengthen medical and pedagogical monitoring through regular functional testing, heart-rate monitoring, and medical examinations.
6. Apply digital technologies, including GPS trackers, heart-rate monitors, and performance analysis software, to optimize training load management and recovery processes.

Conclusion. The findings of the study revealed that elite athletes' performance capacity is significantly influenced by proper training load management, recovery processes, psychological preparation, and the application of modern technologies. The developed set of special exercises and practical recommendations can contribute to improving athletes' functional condition, performance capacity, and competitive effectiveness.

The findings are consistent with previous studies emphasizing the importance of individualized training programs, recovery management, and technological monitoring in elite sports.

The questionnaire results revealed insufficient individualization of training programs, recovery management, and functional monitoring systems among elite athletes.

The main factors affecting athletes' performance capacity were identified as training load, nutrition, psychological condition, rest regime, and medical supervision.

Limited use of modern technologies and functional testing reduces the effectiveness of training management and recovery optimization.

The developed program of 16 special exercises is aimed at improving endurance, strength, coordination, balance, and recovery capacity in elite athletes.

The implementation of individualized approaches, modern recovery methods, and digital monitoring technologies is essential for enhancing performance capacity, reducing injury risk, and achieving high-level sporting results.

References:

1. Schwellnus M., Soligard T., Alonso J.M., Bahr R., Clarsen B., Dijkstra H.P., Gabbett T.J., Gleeson M., Hägglund M., Hutchinson M.R., Janse Van Rensburg C., Meeusen R., Orchard J.W., Pluim B.M., Raftery M., Budgett R., Engebretsen L. How much is too much? Part 2: International Olympic Committee consensus statement on load in sport and risk of illness // British Journal of Sports Medicine. – 2016. – Vol. 50, No. 17. – P. 1043–1052. – DOI: 10.1136/bjsports-2016-096572.
2. Gordon D., Hopkins W.G., O'Connor H., et al. Long-term development of training characteristics and performance-determining factors in elite endurance athletes: A scoping review // Sports Medicine – Open. – 2023. – Vol. 9. – Article 33. – DOI: 10.1186/s40798-023-00597-5.
3. Mănescu D.C., Filip C., Nae C.I., Ciomag R.V. Optimizing Athletic Performance: A Systems Framework for Adaptive Training, Load Management, and Decision-Making // Journal of Functional Morphology and Kinesiology. – 2026. – Vol. 11, No. 3. – Article 245. – DOI: 10.3390/jfmk11030245.
4. Bompa Tudor O.. Periodization: Theory and Methodology of Training. 6 th Edition. Champaign, IL: Human Kinetics, 2019.
5. Zatsiorsky Vladimir M., Kraemer William J.. Science and Practice of Strength Training. Champaign, IL: Human Kinetics, 2020.

6. McArdle William D., Katch Frank I., Katch Victor L.. Exercise Physiology: Nutrition, Energy and Human Performance. Philadelphia: Wolters Kluwer, 2019.
7. Kenney W. Larry, Wilmore Jack H., Costill David L.. Physiology of Sport and Exercise. Champaign, IL: Human Kinetics, 2021.
8. American College of Sports Medicine. ACSM's Guidelines for Exercise Testing and Prescription. Philadelphia: American College of Sports Medicine, 2021.
9. International Olympic Committee. IOC Consensus Statement on Load Management and Injury Prevention in Elite Athletes. 2023. International Olympic Committee
10. World Health Organization. Guidelines on Physical Activity and Sedentary Behaviour. Geneva, 2020. World Health Organization
11. Platonov Vladimir N.. Система подготовки спортсменов в олимпийском спорте. Киев, 2015.
12. Матвеев Л.П.. Общая теория спорта и её прикладные аспекты. Москва: Спорт, 2019.
13. O'zbekiston davlat jismoniy tarbiya va sport universiteti. Спорт физиологияси ва назарияси бўйича ўқув қўлланмалар. Чирчиқ, 2021–2024.
14. O'zbekiston Milliy Olimpiya Qo'mitasi. Юқори малакали спортчиларни тайёрлаш бўйича услубий тавсиялар. Тошкент, 2022. Uzbekistan National Olympic Committee
15. O'zbekiston Respublikasi Sport vazirligi. Спортчиларнинг функционал тайёргарлигини баҳолаш бўйича методик тавсиялар. Тошкент, 2023. Ministry of Sports of Uzbekistan