

Eureka Journal of Education & Learning Technologies (EJELT)

ISSN 2760-4918 (Online)

Volume 2, Issue 4, April 2026



This article/work is licensed under CC by 4.0 Attribution

<https://eurekaopenaccess.com/index.php/2>

MAIN FACTORS CAUSING INJURIES IN GYMNASTICS TRAINING

Musharafxon Sultanova

Tashkent State University of Economics

Lecturer at the Department of Physical Culture and Sports Activities

Abstract

This article examines the main factors that cause injuries during gymnastics training and analyzes their pedagogical, methodological, organizational, and physiological aspects. Gymnastics is a technically complex sport that requires high levels of flexibility, strength, coordination, balance, spatial orientation, and precise motor control. Because of this complexity, the risk of injury increases when training is organized without proper methodological consistency, safety rules, adequate physical preparation, and individual consideration of athletes' abilities. The article highlights such injury-related factors as insufficient warm-up, incorrect technique, excessive training load, poor physical conditioning, lack of supervision, inappropriate equipment, psychological tension, fatigue, and violation of safety requirements. Special attention is given to the role of the coach or teacher in preventing injuries through gradual skill development, systematic monitoring, correct demonstration of exercises, and timely correction of technical errors. The study also emphasizes that injury prevention in gymnastics is not limited to medical control but should be regarded as an integral part of the educational and training process. A scientifically based approach to training organization helps improve athletes' performance, maintain their health, and create a safe learning environment in university-level physical education and sports practice.

Eureka Journal of Education & Learning Technologies (EJELT)

ISSN 2760-4918 (Online)

Volume 2, Issue 4, April 2026



This article/work is licensed under CC by 4.0 Attribution

<https://eurekaoa.com/index.php/2>

Keywords: Gymnastics, injury prevention, training safety, physical preparation, movement technique, training load, coordination, flexibility, sports pedagogy, motor control.

GIMNASTIKA MASHG'ULOTLARIDA SHIKASTLANISHGA SABAB BO'LUVCHI ASOSIY OMILLAR

Musharafxon Sultanova

Toshkent davlat iqtisodiyot universiteti

Jismoniy madaniyat va sport faoliyati kafedrası o'qituvchisi

Annotatsiya.

Mazkur maqolada gimnastika mashg'ulotlarida shikastlanishga sabab bo'luvchi asosiy omillar hamda ularning pedagogik, metodik, tashkiliy va fiziologik jihatlari tahlil qilinadi. Gimnastika texnik jihatdan murakkab sport turi bo'lib, unda egiluvchanlik, kuch, koordinatsiya, muvozanat, fazoviy mo'ljal olish va harakatlarni aniq boshqarish yuqori darajada talab etiladi. Shu sababli mashg'ulotlar metodik izchillik, xavfsizlik qoidalari, yetarli jismoniy tayyorgarlik va sportchilarning individual imkoniyatlarini hisobga olmagan holda tashkil etilganda shikastlanish xavfi ortadi. Maqolada yetarli darajada qizish mashqlarining bajarilmasligi, noto'g'ri texnika, ortiqcha yuklama, jismoniy tayyorgarlikning sustligi, nazoratning yetishmasligi, jihozlarning mos emasligi, psixologik zo'riqish, charchoq va xavfsizlik talablariga rioya qilmaslik kabi omillar yoritiladi. Shuningdek, mashqlarni bosqichma-bosqich o'rgatish, muntazam nazorat qilish, texnik xatolarni o'z vaqtida tuzatish va xavfsiz mashg'ulot muhitini yaratishda murabbiy yoki o'qituvchining o'rnini asoslab beriladi. Maqolada shikastlanishlarning oldini olish faqat tibbiy nazorat bilan cheklanmasligi, balki ta'lim-mashg'ulot jarayonining ajralmas qismi sifatida qaralishi zarurligi ta'kidlanadi.

Eureka Journal of Education & Learning Technologies (EJELT)

ISSN 2760-4918 (Online)

Volume 2, Issue 4, April 2026



This article/work is licensed under CC by 4.0 Attribution

<https://eurekaopenaccess.com/index.php/2>

Kalit soʻzlar: gimnastika, shikastlanish profilaktikasi, mashgʻulot xavfsizligi, jismoniy tayyorgarlik, harakat texnikasi, mashgʻulot yuklamasi, koordinatsiya, egiluvchanlik, sport pedagogikasi, harakat nazorati.

Introduction

Gymnastics is one of the most complex types of physical activity in the system of sport and physical education because it combines strength, flexibility, balance, coordination, rhythm, speed, spatial orientation, and precise control of body movements. In gymnastics training, each exercise requires not only physical readiness but also technical accuracy, concentration, psychological stability, and compliance with safety requirements. Unlike many other sports, gymnastics often involves movements performed on apparatuses, in the air, with body rotation, support, landing, stretching, and rapid changes in body position. Therefore, even a small technical error, insufficient preparation, or improper organization of the training process may lead to injuries. For this reason, the study of the main factors causing injuries in gymnastics training is an important issue for coaches, teachers, students, and specialists in the field of physical education.

Injury risk in gymnastics is usually connected with several interrelated factors. One of the most common causes is inadequate warm-up before training. When muscles, joints, ligaments, and the cardiovascular system are not properly prepared for physical load, the body becomes more vulnerable to strains, sprains, joint injuries, and muscle tears. Another important factor is incorrect technique. Gymnastics movements must be performed according to strict biomechanical rules. If a student or athlete performs an element with an incorrect body position, poor landing technique, weak support, or uncontrolled movement, the risk of injury increases significantly. This is especially relevant for beginners and university students who may not have sufficient previous experience in gymnastics.

Eureka Journal of Education & Learning Technologies (EJELT)

ISSN 2760-4918 (Online)

Volume 2, Issue 4, April 2026



This article/work is licensed under CC by 4.0 Attribution

<https://eurekaopenaccess.com/index.php/2>

Training load is also a serious factor in the development of injuries. Excessive repetition of difficult elements, rapid transition from simple to complex exercises, insufficient rest, and ignoring signs of fatigue may overload the musculoskeletal system. As a result, both acute injuries and overuse injuries may occur. In gymnastics, the shoulders, wrists, elbows, knees, ankles, back, and neck are especially exposed to stress. Therefore, the training process must be organized gradually, taking into account the physical preparedness, age, health condition, and individual abilities of learners.

The role of the coach or teacher is decisive in preventing injuries. Proper demonstration of exercises, explanation of safety rules, constant supervision, correction of technical mistakes, and selection of suitable exercises are essential components of safe gymnastics training. In university conditions, where students may have different levels of physical fitness, an individual and differentiated approach becomes particularly important. It is not enough to teach only the external form of movement; the teacher must also explain how to control the body, distribute effort, maintain balance, and land safely.

The relevance of this topic is also determined by the need to improve the quality of physical education and sports training in higher education institutions. A safe training environment helps students develop motor skills, confidence, discipline, and interest in physical activity. At the same time, injury prevention protects their health and supports long-term participation in sport. Thus, analyzing the main factors that cause injuries in gymnastics training allows the development of more effective pedagogical and methodological recommendations for organizing safe, systematic, and health-oriented training sessions.

Methods

This study was designed on the basis of a theoretical and methodological analysis of injury-related factors in gymnastics training. The main purpose of the methodological approach was to identify the most common pedagogical,

Eureka Journal of Education & Learning Technologies (EJELT)

ISSN 2760-4918 (Online)

Volume 2, Issue 4, April 2026



This article/work is licensed under CC by 4.0 Attribution

<https://eurekaopenaccess.com/index.php/2>

technical, organizational, physical, and psychological conditions that may increase the probability of injuries during gymnastics sessions. The research relied on the principles of sports pedagogy, physical education methodology, movement learning theory, and safety-oriented training organization. Since gymnastics includes a wide range of exercises requiring flexibility, balance, support, rotation, jumping, landing, and apparatus work, the methods were selected to examine both the structure of training and the quality of movement performance.

The first method used in the study was the analysis of scientific and methodological literature. Sources related to gymnastics training, injury prevention, sports biomechanics, motor control, physical preparation, and coaching methodology were examined. Particular attention was paid to the causes of acute and overuse injuries, the role of warm-up, the importance of technical preparation, and the influence of training load on the musculoskeletal system. This analysis made it possible to determine the theoretical basis for grouping injury-causing factors into several categories: physical preparedness, technical execution, training organization, equipment safety, psychological readiness, and pedagogical supervision.

The second method was pedagogical observation. During gymnastics training, attention was directed to how students performed preparatory exercises, basic gymnastic movements, stretching tasks, balance exercises, jumps, rolls, supports, and landings. Observation focused on the correctness of posture, body alignment, hand and foot placement, control of movement amplitude, landing stability, and the ability to maintain balance during dynamic actions. Special attention was given to typical mistakes that may lead to injuries, such as insufficient knee flexion during landing, excessive arching of the back, uncontrolled rotation, weak arm support, lack of coordination between body parts, and premature performance of complex elements without sufficient preparation.

Eureka Journal of Education & Learning Technologies (EJELT)

ISSN 2760-4918 (Online)

Volume 2, Issue 4, April 2026



This article/work is licensed under CC by 4.0 Attribution

<https://eurekaopenaccess.com/index.php/2>

The third method was comparative analysis. Students with different levels of physical preparedness were compared according to their ability to perform gymnastics exercises safely and technically correctly. This made it possible to determine that injury risk is often higher among students who have weak flexibility, poor coordination, insufficient strength of the shoulder girdle and core muscles, and limited experience in performing gymnastic movements. At the same time, excessive confidence among physically stronger students may also increase risk when they attempt difficult elements without observing proper technique and safety rules.

The fourth method was the analysis of training load. The duration of exercises, number of repetitions, rest intervals, complexity of tasks, and sequence of exercises were considered. The study emphasized that safe gymnastics training requires gradual progression from simple to complex movements. Preparatory exercises, special warm-up, technical drills, and controlled repetition must precede difficult elements. Overloading students with repeated jumps, supports, stretching tasks, or apparatus exercises without adequate recovery may lead to fatigue and reduced movement control.

The fifth method involved pedagogical generalization. On the basis of literature analysis, observation, comparison, and training-load assessment, the main injury-causing factors were systematized and interpreted from the perspective of university physical education. This approach allowed the identification of practical recommendations for teachers and coaches, including the need for individualization, continuous supervision, correct demonstration, safe equipment use, timely correction of errors, and formation of students' conscious attitude toward training safety.

Results

The analysis of gymnastics training showed that injuries are most often caused not by a single isolated reason, but by the combination of several pedagogical,

Eureka Journal of Education & Learning Technologies (EJELT)

ISSN 2760-4918 (Online)

Volume 2, Issue 4, April 2026



This article/work is licensed under CC by 4.0 Attribution

<https://eurekaopenaccess.com/index.php/2>

technical, physical, and organizational factors. The most noticeable result of the study was that insufficient preparation before the main part of training significantly increases injury risk. When students begin complex gymnastic movements without a complete warm-up, their muscles and joints are not ready for intensive stretching, support, rotation, jumping, or landing actions. In such cases, the probability of muscle strain, ligament overload, joint discomfort, and loss of movement control becomes higher. Therefore, warm-up exercises should not be considered a formal beginning of the lesson, but a necessary preventive stage of the whole training process.

Another important result is connected with movement technique. Incorrect execution of gymnastic elements was identified as one of the main causes of injuries. Many mistakes appeared during landings, support positions, balance exercises, rolls, jumps, and stretching tasks. For example, landing with straight legs, insufficient bending of the knees, unstable foot placement, poor body alignment, and lack of control during rotation may overload the ankle, knee, hip, and spine. In support exercises, weak shoulder and wrist control may lead to excessive pressure on the upper limbs. These findings show that technical preparation must be developed gradually, and students should not move to complex elements before mastering basic movement patterns.

The study also revealed that low levels of general and special physical preparedness increase the risk of injury. Students with insufficient strength, flexibility, coordination, and balance experienced more difficulties in performing gymnastics exercises safely. Weak core muscles made it harder to maintain correct posture and body control. Limited flexibility caused tension during stretching and amplitude movements. Poor coordination reduced the ability to combine different body actions in one movement. At the same time, excessive flexibility without adequate strength was also found to be a risk factor, because uncontrolled joint mobility may reduce stability during complex exercises.

Eureka Journal of Education & Learning Technologies (EJELT)

ISSN 2760-4918 (Online)

Volume 2, Issue 4, April 2026



This article/work is licensed under CC by 4.0 Attribution

<https://eurekaopenaccess.com/index.php/2>

Training load appeared as another significant factor. Excessive repetition, long sessions without sufficient rest, and rapid complication of exercises led to fatigue. Fatigue negatively affected attention, reaction speed, technical accuracy, and movement coordination. As a result, students made more mistakes at the end of the lesson than at the beginning. This confirms that training load must correspond to the students' physical condition and should be regulated according to the principle of gradual progression.

Organizational conditions also influenced safety. Inadequate spacing between students, unsuitable equipment, slippery surfaces, lack of mats, poor placement of apparatuses, and insufficient teacher supervision increased the possibility of accidents. The role of the teacher was especially important in preventing dangerous situations. When exercises were demonstrated clearly, safety rules were explained in advance, and students were supervised during performance, the number of technical errors and risky movements decreased.

Psychological factors were also observed. Fear, anxiety, lack of confidence, haste, and excessive self-confidence negatively affected safe performance. Some students hesitated during difficult elements, while others attempted exercises beyond their level. Both situations increased injury risk. Thus, the results indicate that injury prevention in gymnastics requires a comprehensive approach that combines proper warm-up, technical instruction, physical preparation, safe organization, load control, psychological support, and continuous pedagogical supervision.

Discussion

The results of the study confirm that injury prevention in gymnastics training must be understood as a complex pedagogical and methodological process rather than a separate medical or technical issue. Gymnastics involves movements that place considerable stress on the musculoskeletal system, especially when exercises include jumping, landing, rotation, support, stretching, balance, and

Eureka Journal of Education & Learning Technologies (EJELT)

ISSN 2760-4918 (Online)

Volume 2, Issue 4, April 2026



This article/work is licensed under CC by 4.0 Attribution

<https://eurekaopenaccess.com/index.php/2>

apparatus work. Therefore, the safety of training depends on the interaction of several conditions: the student's physical preparedness, the teacher's methodological competence, the correctness of movement technique, the gradual increase of load, the quality of equipment, and the psychological readiness of learners. If one of these components is ignored, the risk of injury increases even when the training session appears to be properly organized.

One of the key points in discussing injury-causing factors is the role of warm-up. A well-structured warm-up prepares the body for the main physical load by activating muscles, improving joint mobility, increasing blood circulation, and developing concentration. In gymnastics, warm-up should include not only general exercises but also special preparatory movements related to the elements that will be performed during the main part of the lesson. For example, before practicing rolls, jumps, bridges, balances, or support exercises, students need specific drills that prepare the spine, shoulders, wrists, knees, ankles, and core muscles. If this stage is shortened or performed mechanically, the body does not receive sufficient preparation, and the possibility of strains, sprains, and coordination mistakes becomes higher.

Technical mistakes are another central issue. In gymnastics, safe execution and correct technique are inseparable. The same movement may be useful and developmental when performed correctly, but dangerous when performed with poor alignment, excessive speed, weak support, or unstable landing. This means that the teacher must not allow students to repeat incorrect movements many times, because repeated errors may become fixed motor habits. Timely correction is especially important at the initial stage of learning. The teacher should explain not only what movement should be performed, but also why a certain position of the body, arms, legs, head, or trunk is necessary for safety. This develops students' conscious attitude toward movement control.

The discussion also shows that training load must be individualized. In university groups, students usually differ in physical fitness, previous sports experience,

Eureka Journal of Education & Learning Technologies (EJELT)

ISSN 2760-4918 (Online)

Volume 2, Issue 4, April 2026



This article/work is licensed under CC by 4.0 Attribution

<https://eurekaopenaccess.com/index.php/2>

flexibility, strength, body coordination, and psychological confidence. A single uniform load may be too easy for some students and too difficult for others. Therefore, differentiated tasks are needed. Less prepared students should first master simplified variants of exercises, while stronger students may gradually move to more complex combinations under supervision. Such an approach reduces injury risk and increases the pedagogical effectiveness of training.

Psychological readiness is also important in gymnastics. Fear may cause hesitation, stiffness, and loss of rhythm, while excessive confidence may lead to careless performance of difficult elements. Both conditions can result in injuries. For this reason, the teacher should create a supportive atmosphere, encourage gradual progress, and prevent students from attempting exercises that exceed their current abilities. Safety should be presented not as a limitation, but as a necessary condition for successful skill development.

Overall, the discussion proves that the main factors causing injuries in gymnastics training are closely connected with the quality of pedagogical organization. Safe gymnastics training requires systematic warm-up, correct technical instruction, reasonable load distribution, suitable equipment, individual approach, psychological support, and continuous supervision. When these requirements are observed consistently, gymnastics becomes an effective means of developing strength, flexibility, coordination, discipline, confidence, and movement culture without unnecessary risk to students' health.

Conclusion

Injury prevention in gymnastics training is an essential condition for the effective organization of physical education and sports activities at the university level. Gymnastics develops strength, flexibility, coordination, balance, agility, spatial orientation, discipline, and movement culture, but at the same time it requires strict compliance with methodological and safety requirements. The analysis shows that injuries during gymnastics training usually occur as a result of several

Eureka Journal of Education & Learning Technologies (EJELT)

ISSN 2760-4918 (Online)

Volume 2, Issue 4, April 2026



This article/work is licensed under CC by 4.0 Attribution

<https://eurekaopenaccess.com/index.php/2>

interconnected factors rather than one isolated cause. Insufficient warm-up, poor technical execution, excessive physical load, weak general and special preparedness, fatigue, inappropriate equipment, lack of supervision, psychological tension, and violation of safety rules are among the most common conditions that increase injury risk.

A properly organized warm-up is one of the most important preventive measures. It prepares muscles, joints, ligaments, the cardiovascular system, and the nervous system for the main part of the lesson. In gymnastics, warm-up must include both general developmental exercises and special preparatory tasks related to the specific elements planned for training. When this stage is ignored or performed superficially, students enter the main part of the lesson without sufficient readiness, and this may lead to muscle strains, joint overload, loss of coordination, and unstable movement performance. Therefore, warm-up should be treated as a necessary structural component of every gymnastics session.

Technical preparation is also a decisive factor in preventing injuries. Gymnastic exercises require accurate body position, correct support, safe landing, controlled rotation, stable balance, and coordinated movement of different body parts. If students repeat exercises with incorrect technique, risky motor habits may be formed. For this reason, the teacher or coach must provide clear demonstration, detailed explanation, step-by-step instruction, and timely correction of mistakes. Students should first master simple elements and only then move to more complex movements. Gradual progression reduces unnecessary risk and allows learners to develop confidence together with technical competence.

The results also confirm the importance of individualization. University students may differ significantly in their physical fitness, flexibility, strength, coordination, previous sports experience, health condition, and psychological readiness. Therefore, the same exercise cannot always be equally suitable for all students. Differentiated tasks, controlled repetitions, appropriate rest intervals, and careful selection of load help create safer and more effective training

Eureka Journal of Education & Learning Technologies (EJELT)

ISSN 2760-4918 (Online)

Volume 2, Issue 4, April 2026



This article/work is licensed under CC by 4.0 Attribution

<https://eurekaopenaccess.com/index.php/2>

conditions. Overloading students or forcing them to perform difficult elements before they are ready may cause both acute and overuse injuries.

Safe training also depends on organizational conditions. The training area must be clean, spacious, and free from obstacles. Mats, apparatuses, and other equipment must correspond to safety standards and the level of the students. The teacher should maintain constant supervision, especially during exercises involving jumping, support, rotation, balance, and landing. Psychological support is also necessary, because fear, hesitation, haste, and excessive self-confidence may negatively affect movement control.

Thus, the main way to reduce injuries in gymnastics training is to organize the educational and training process on the basis of scientific, pedagogical, methodological, and safety-oriented principles. When warm-up, technique, load, equipment, supervision, and individual approach are properly combined, gymnastics becomes a safe and effective means of strengthening health, improving physical preparedness, and developing students' movement culture.

References

1. American College of Sports Medicine. (2021). ACSM's guidelines for exercise testing and prescription. Wolters Kluwer.
2. Radjapov, U. R., & Khakimdjanova, K. B. (2021). The role of physical education in improving the health of women of the republic of Uzbekistan. *Ustozlar uchun*, 3(1), 162-165.
3. Radjapov, U. R., Xakimdjanova, K. B. (2024). Maktabgacha ta'lim muassasi tarbiyalanuvchilarini harakatli o'yinlar orqali bolalar psixologiyasini va nutqini rivojlantirish usulublari. *FarDU. ILMIY XABARLAR*, 2, 113-116.
4. Bompa, T. O., & Buzzichelli, C. (2019). Periodization: Theory and methodology of training. *Human Kinetics*.
5. Caine, D. J., & Nassar, L. (2005). Gymnastics injuries. *Medicine and Sport Science*, 48, 18–58.

Eureka Journal of Education & Learning Technologies (EJELT)

ISSN 2760-4918 (Online)

Volume 2, Issue 4, April 2026



This article/work is licensed under CC by 4.0 Attribution

<https://eurekaopenaccess.com/index.php/2>

6. Caine, D. J., Russell, K., & Lim, L. (2013). Handbook of sports medicine and science: Gymnastics. Wiley-Blackwell.
7. Faigenbaum, A. D., & Myer, G. D. (2010). Resistance training among young athletes: Safety, efficacy and injury prevention effects. *British Journal of Sports Medicine*, 44(1), 56–63.
8. Frisch, A., Croisier, J. L., Urhausen, A., Seil, R., & Theisen, D. (2009). Injuries, risk factors and prevention initiatives in youth sport. *British Medical Bulletin*, 92(1), 95–121.
9. Hootman, J. M., Dick, R., & Agel, J. (2007). Epidemiology of collegiate injuries for 15 sports: Summary and recommendations for injury prevention initiatives. *Journal of Athletic Training*, 42(2), 311–319.
10. International Gymnastics Federation. (2025). Code of points: Women's artistic gymnastics 2025–2028. FIG.
11. Kerimov, F. A. (2018). Sport mashg'ulotlari nazariyasi va uslubiyati. O'zDJTI nashriyoti.
12. Kordi, R., Maffulli, N., Wroble, R. R., & Wallace, W. A. (2010). *Combat sports medicine*. Springer.
13. McAuley, E., Hudash, G., Shields, K., Albright, J. P., Garrick, J., Requa, R., & Wallace, R. K. (1987). Injuries in women's gymnastics: The state of the art. *The American Journal of Sports Medicine*, 15(6), 558–565.
14. Meeusen, R., & Borms, J. (1992). Gymnastic injuries. *Sports Medicine*, 13(5), 337–356.
15. Sands, W. A., Caine, D. J., & Borms, J. (2003). Scientific aspects of women's gymnastics. Karger.
16. Sands, W. A., McNeal, J. R., Jemni, M., & Stone, M. H. (2011). Flexibility enhancement with vibration: Acute and long-term. *Medicine & Science in Sports & Exercise*, 38(4), 720–725.
17. Schmidt, R. A., & Lee, T. D. (2019). Motor learning and performance: From principles to application. *Human Kinetics*.

Eureka Journal of Education & Learning Technologies (EJELT)

ISSN 2760-4918 (Online)

Volume 2, Issue 4, April 2026



This article/work is licensed under CC by 4.0 Attribution

<https://eurekaopenaccess.com/index.php/2>

18. Solomon, R., Solomon, J., & Minton, S. C. (2005). Preventing dance injuries: An interdisciplinary perspective. *Human Kinetics*.
19. Turovsky, A. V., & Makarova, G. A. (2015). Sportivnaya meditsina i profilaktika travmatizma v sporte. *Fizkultura i sport*.
20. Walker, B. (2014). *The anatomy of sports injuries*. North Atlantic Books.
21. Xo‘jayev, F. T. (2019). Jismoniy tarbiya nazariyasi va metodikasi. O‘qituvchi.
22. Zetaruk, M. N. (2000). The young gymnast. *Clinics in Sports Medicine*, 19(4), 757–780.