Bulletin of the *Transilvania* University of Braşov
Series IX: Sciences of Human Kinetics • Vol. 18(67) No. 2 – 2025
https://doi.org/10.31926/but.shk.2025.18.67.2.6

SPECIFIC ASPECTS OF SPORTS TRAINING IN KARATE DO FOR BEGINNERS TO PREVENT INJURIES DURING TRAINING AND COMPETITIONS

M. I. GHEORGHIAN[1] L. N. MIHĂILESCU[1] R. L. PETRE[2]

Abstract: *This scientific review analyses the fundamental principles of sports education in the martial arts, with a focus on Karate, and emphasises the importance of well-structured training for beginners. It also discusses the role of mental and psychological training alongside the physical, theoretical, technical and tactical training specific to Karate. The study argues the need to combine the technical-tactical components with the emotional and psychological components to reduce the incidence of injuries to practitioners. It also presents a series of measures aimed at preventing injuries so that training and competitions can take place in a safe environment.*

Keywords: *Karate; beginner; technical, physical, and psychological training; injuries; training safety*.

1. Introduction

Depending on the level of contact that is made between practitioners, martial arts are classified as follows:

- Martial arts with continuous contact or connection.
- Martial arts with intermittent contact or semi-permanent connection.
- Non-contact martial arts or martial arts with contact mediated by different objects or weapons [4].

Karate falls into the second category and belongs to a distinct class due to its unique characteristics, having a key role in the development of the individual on a biological and psychological level [4]. At the same time, it maintains a strong educational, spiritual and attitudinal orientation, which is highly valued [21].

Karate is a combat method designed for self-defense, requiring the mobilization of mental and physical resources necessary to execute a rapid, efficient, and strategically targeted action [15].

Therefore, practicing Karate involves several risks of injury during training and competitions, particularly for beginners in the children and adolescent categories.

In this respect, there are valid concerns

1 National University of Science and Technology Politehnica Bucharest, University Centre of Pitești, Doctoral School of Sports Science and Physical Education, Romania.
2 National University of Physical Education and Sports, Bucharest, Romania.

about implementing measures, procedures, techniques and equipment to prevent injuries, aimed at both reducing vulnerabilities and eliminating injury risks, taking into account the specific training needs of beginners in this area of sport.

2. Objectives

In order to identify the specific measures, procedures, techniques and equipment for Karate sports training, I conducted preliminary research in specialist scientific literature. Research focused on the particularities of sports training for beginners, especially high-frequency injury types in this sport. Additionally, I examined factors that may increase practitioners' vulnerability to injury.

Also, through the present study we will highlight the importance of psycho-physical training for beginner practitioners in reducing competitive stress and, implicitly, in preventing injuries.

Furthermore, by examining several specialized studies in the field of martial arts, we will carry out a comparative analysis of injuries among different martial arts styles to highlight the peculiarities of the Karate style in relation to other branches.

3. Materials and Methods

For the preparation of this review article, we consulted prestigious scientific databases such as Google Scholar, PubMed, ResearchGate and the National Bibliometric Tool.

We analyzed articles published in: The Library of Science, Bulletin of the Transilvania University of Brașov, Discobolul, The Central and Eastern European Online Library, Gymnasium, Current Sports Medicine Reports, Frontiers, Biomedical and The American Academy of Pediatrics.

Throughout the research we considered the following keywords, “karate”, “technical, physical and psychological training”, “injuries”, “training safety”, “competitive stress” and “overtraining”.

We also included books and doctoral theses in the field of physical education and martial arts. Sources cited include works by the authors: Ardelean, V.P., Deliu, D., Galan, D., Galan, D. D., Gavrilă, R. G., Petre, R. L. and Tudorel, S.

Structured, critical and comparative content analysis of specialized literature and data processing method were used as research methods.

4. Results and Discussions

4.1. Typology of injuries in martial arts

Most experts recommend 6 years as the proper starting age for practicing this sport. From ages 8–9, children can explore competition through individual and team kata events, which are scored [10, 26].

Studies emphasize that children aged 10–12 undergo a unique physical development rhythm, requiring training methods to be adapted accordingly. Sessions should be structured in phases: general, pre-competitive, and competitive training [7].

As in any contact or semi-contact sport, trauma has a major impact on Karate practitioners. Most athletes, whether beginners or advanced, have suffered at least one injury during their training [5].

The risk factors that contribute to injuries are divided into **internal** and **external**. Internal factors are the athlete's

anatomy and biomechanics, muscular imbalances, reduced mobility, strong muscular contractions, stretching beyond the elasticity limit, age and weight, etc. External factors are training errors, climatic conditions, inadequate or lack of equipment, competition rules and poor nutrition, etc. [3], [16], [24].

A study of 125 professional Karate practitioners in Poland reveals that the most common injuries are concussions, followed by sprains and muscle strains.

Another study involving 61 Karate practitioners showed that the most common injuries were concussions (91%) and joint injuries (49%), mainly affecting the left leg (23%) and the right hand (19%) [22].

This is why emphasis is placed on the correct organization of training and the use of protective equipment to reduce injuries [2].

Therefore, to reduce injuries, "the method of sports training is in a continuous process of evolution, the mental and physical qualities of the athlete providing a solid basis for strengthening the technical and tactical elements" [9].

Another significant risk factor in practicing martial arts is overtraining, which may contribute to spinal deficiencies.

A study of 20 Judo athletes showed that 90% of them showed postural abnormalities such as kyphosis, scoliosis or kyphosoliosis [25].

However, Karate does carry a moderate risk of injury. The most common types of injuries are concussions and lacerations, and the most affected areas are the head and neck, including injuries to the lips or nose, and less commonly to the eyes or ears [6], [16], [17], [19], [26]. Head impacts and projections can also cause concussions, fractures and other severe injuries.

In martial arts, the injury incidence rate ranges from 41 to 133 injuries per 1000 athletic exposures, with a higher risk of injury in Taekwondo, Judo and MMA [11].

In the case of Judo, some changes have been proposed to the rules of competitions to reduce and prevent sports injuries [8].

For Karate, we recommend considering some of the following measures: Increasing penalty durations in competitions, thus giving the practitioner the opportunity to recover after a forbidden or strong strike, limiting dangerous strikes and preventing overexertion [8], [16]. There is also an emphasis on reducing aggression in competition and dropping practitioners who show high levels of aggression [8].

The analysis of scientific literature for this article reveals that the most common injuries in Karate are concussions, sprains and muscle strains.

The results of this article confirm that well-structured training programs, adapted to beginner Karate practitioners, contribute significantly to reducing the injury risks.

As a contact or semi-contact sport, Karate carries a moderate injury risk compared to other martial arts. The reviewed studies confirm that a well-structured training approach combining physical, technical-tactical and psychological training can substantially decrease injury rates.

Karate includes multiple styles, each with their own technical and tactical characteristics that influence the risk of injury: the Shotokan and Shito-Ryu styles are associated with moderate injury risk,

due to their emphasis on technical control and precise execution of strikes. In contrast, the Goju-Ryu style has a higher frequency of joint injuries because of its intensive locking techniques.

We believe that a comparative study on injuries specific to each style of Karate could contribute to the development of effective strategies to prevent them.

At the same time, based on the analyzed studies, we have elaborated Table 1, which highlights the areas prone to injuries and injury typology specific to athletes practicing four martial arts styles, as follows:

Table 1

Injury-prone areas and injury typology in Martial Arts

Karate	**Judo**	**MMA**	**Taekwondo**
Injury-Prone Areas	**Injury-Prone Areas**	**Injury-Prone Areas**	**Injury-Prone Areas**
Head / Neck / Face / Legs	Shoulder / Elbow / Knee / Neck	Head and Face / Jaw / Ribs / Upper Joints	Knee / Ankle / Hip / Head / Face / Ribs
Injury Types	**Injury Types**	**Injury Types**	**Injury Types**
- Concussions - Sprains - Muscle strains - Eppistaxis - Luxations	- Sprains - Luxations - Neck injuries - Joint dislocations - Ligament tears - Brain injuries	- Head injuries - Brain injuries - Mandibular fractures - Shoulder dislocations - Rib fractures	- Sprains - Nose fractures - Cuts and lacerations - Meniscal injuries - Chronic lower back pain

4.2. The importance of psychological preparation in reducing injuries

Sports performance and fitness generally result from the interplay of technical, tactical, psychological, and physical abilities [18].

Consequently, Karate emphasizes stage-based psychological preparation: basic, special, and competitive [14].

Psychological strategies, such as emotional self-monitoring, positive self-suggestions, biofeedback, self-esteem development and relaxation /communication techniques are recommended to improve athletes' performance and safety [1], [20].

Stress is also an external factor that often contributes to an increased risk of injury, particularly for beginners in children and teenagers, during training, but especially during competitions.

Mental preparation serves as a crucial element for both injury prevention and competitive success, complementing technical, tactical, and physical training [23].

A study conducted in 2015, analyses the development of physical, technical-tactical and psychomotor capabilities of judokas by correcting the training and coaching process. So, it is recommended to implement strategic corrections to avoid physical overload and to maximize athletic performance [27].

Experts in this field recommend breathing exercises, water and music therapy, positive thinking, diversifying training, etc. [12].

A study of Ju-Jitsu practitioners shows that they have lower levels of physical and verbal aggression and hostility towards non-sporting people, but higher levels of anger in athletes, possibly due to the

competitive nature of the sport [13].

Mental preparation is also an important aspect of injury prevention. The cited studies have shown that athletes who apply emotional self-monitoring, self-suggestion and biofeedback techniques are better able to manage competitive stress. These techniques help reduce mistakes that can lead to various injuries.

Limitations of this study include the lack of empirical data analysis collected from Karate specific training.

5. Conclusions

Karate does not typically present a significant risk of serious injury, except for sprains and consumption, which represent the most common injuries in this sport.

These minor injuries predominantly affect facial areas as due to physical contact during training and competition, yet they pose minimal health risks to practitioners compared to other martial arts.

Well-structured, methodical training tailored to the needs of each athlete, combined with the use of effective injury prevention strategies, can significantly contribute to reducing the risk of injury.

Through proper technique application, mental preparation, compliance whit safety protocols, and use of proper protective gear, practitioners can engage in Karate safely and effectively.

The factors influencing the occurrence of Karate injuries vary according to the age of the practitioners as well as their training experience. As the practitioner gains more experience and develops their techniques, the type and frequency of injuries may change.

It is important that Karate training is adapted according to the practiced style, the age and level of training of the practitioners. A progressive program for beginners, focusing on reinforcing fundamental techniques and developing basic motric skills, can contribute significantly to reducing injuries.

For future research, a comparative analysis of different Karate styles and their distinct characteristics' impact on injury incidence would be valuable. Additionally, experimental studies investigating how mental training techniques reduce stress and prevent injuries could significantly enrich scientific literature.

Considering the conclusions of this article, we propose some preventive measures that can help to prevent and cut some risks of injury during training and competition in the safe practice of Karate:

- Well-structured training for beginner Karate practitioners to ensure progressive and balanced development.
- Mental and psychological preparation of athletes at the same time with physical, theoretical and technical-tactical training.
- Watching the risk factors that contribute to injuries in training and sports competitions.

References

1. Alexe, C. I., Alexe, D. I., et al.: *Fighting competition stress by focusing the psychological training on the vigor-activity mood states*. In: Gymnasium–Scientific Journal of Education, Sports, and Health, Vol. XIV, No. 1, 2013, p. 1–9,
2. Ambrozy, T., Mucha, D., et al.: *Most common injuries to professional contestant karate.* In: Security Dimensions International & National Studies, Polonia, No. 16, 2015, p. 142-164, https://bibliotekanauki.pl/

articles/1832477, accessed on 16th March 2025, at 20:10.
3. Antohe, B. A., Rață, M., et al.: *Muscle injury in sports activity – etiologi, classification and treatment.* In: Bulletin of the Transilvania University of Brașov, Series IX: Sciences of Human Kinetics, Vol. 15(64), No. 2, 2022, p. 21–28, https://doi.org/10.31926/but.shk.2022.15.64.2.2
4. Ardelean, V. P.: *Arte marțiale– elemente tehnice de bază și noțiuni de biomecanică (Martial Arts – basic technical elements and biomechanics concepts).* Bucharest, Editura Pro Universitaria, 2023.
5. Buzatu, C., Arsene, I., et al.: *Studiu statistic al traumelor în diferite probe de sport (Sratistical Study of Injuries in Different Sports Events).* In: Conferința științifică a tinerilor cercetători cu participare internațională "Probleme actuale ale teoriei și practicii culturii fizice", First edition, Chișinău, Moldova, 13 aprilie 2023, p. 85–91, https://ibn.idsi.md/vizualizare_articol/219400, accessed on 16th March 2025, at 08:20.
6. Buzescu, A., Păunescu, M., et al.: *Considerații privind recuperarea accidentărilor în taekwondo (Considerations on injury recovery in Taekwondo).* In: Discobolul – Revista UNEFS de cultură, educație, sport și kinetoterapie, Anul VI, No. 4(22), 2010, p. 58–64, https://discobolulunefs.ro/Reviste/2010/Discobolul_4_2010_extenso.pdf, accessed on 15th March 2025, at 08:35.
7. Caracaleanu, S. G., Caracaleanu, C. M.: *Dezvoltarea fizică, element calitativ al procesului biologic în antrenamentul copiilor de 10-12 ani (Physical development, a qualitative element of the biological process in the training of 10-12 year old children).* In: Știința Culturii Fizice, No. 34(2), 2019, p. 77-82, https://ibn.idsi.md/ro/vizualizare_articol/115225, accessed on 16 March 2025, at 16:10.
8. Chirazi, M.: *Impact of judo rules amendments over trauma prevention.* In: Bulletin of the Transilvania University of Brașov, Series IX: Sciences of Human Kinetics, Vol. 13 (62), No. 1, 2020, p. 193–198, https://doi.org/10.31926/but.shk.2020.13.62.1.25
9. Cojocaru, M., Mereuța, C., et al.: *Analytical study of the dynamic of physical, functional and motrical development to beginners practitioners of karate shotokan, cadets and juniors.* In: Bulletin of the Transilvania University of Brașov, Series IX: Sciences of Human Kinetics, Vol. 14(63), No. 2, 2021, p. 47–54, https://doi.org/10.31926/but.shk.2021.14.63.2.5
10. Deliu, D.: *Metodica disciplinelor sportive de combat (Methodology of combat sports disciplines)*. Bucharest, Editura Bren, 2008.
11. Demorest, R.A., M. D., et al.: *Youth participation and injury risk in martial arts.* In: American Academy of Pediatrics, Vol. 138, No. 6, decembrie 2016, p. 1–9, https://doi.org/10.1542/peds.2016-3022
12. Galan, D.: *Psycho-physical performance and stress in the sports group.* In: Logos Universality Mentality Education Novelty, Section: Social Sciences, Vol. VI, No. 1, 2017, p. 33–40, http://dx.doi.org/10.18662/lumenss.2017.0601.03
13. Galan, D. D., Gloria, R., et al.: *A comparative study on the level of*

aggressivity of athletes practicing ju-jitsu and non-practitioners. In: Gymnasium – Scientific Journal of Education, Sports, and Health, Vol. XVII, No. 2, 2016, https://doi.org/10.29081/gsjesh.2016.17.2.11

14. Galan, D. D.: *Strategii de îmbunătățire a rezultatelor sportive la practicanții de Ju-Jitsu din sistemele duo-demonstrativ și fighting la nivelul aspiranților și juniorilor (Strategies for improving sports performance in Ju-Jitsu practitioners in the duo-demonstrative and fighting systems at the aspirant and junior levels).* Teza de doctorat. Universitatea Națională de Educație Fizică și Sport, București, 2016.
15. Gavrilă, R. G.: *Optimizarea pregătirii sportivilor karateka, stilul Wado Ryu, prin îmbunătățirea vitezei de execuție (Optimizing the training of Karate athletes, Wado Ryu style, by improving execution speed).* Rezumat teză de doctorat. Universitatea Națională de Educație Fizică și Sport, București, 2019, https://scoaladoctoralaunefs.ro/wp-content/uploads/2019/07/rezumat-teza-doctorat-gavrila-radu-2-1.pdf, accessed on 15th March 2025, at 07:50.
16. Koutures, C., MD, et al.: *Participation and Injury in Martial Arts*. In: Current Sports Medicine Reports 17(12), december 2018, p. 433-438, *DOI:* 10.1249/JSR.0000000000000539
17. Lystad, R. P., Augustovicova, D., et al.: *Epidemiology of injuries in Olympic-style karate competitions: systematic review and meta-analysis.* In: British Journal of Sports Medicine, Vol. 54, No. 16, 2020, p. 1–10, DOI: 10.1136/bjsports-2020-101990
18. Mocioacă, D., Dragomir, M.: *Peculiarities of physical training in the case of ashihara karate style practitioners.* In: Bulletin of the Transilvania University of Brașov, Series IX: Sciences of Human Kinetics, Vol. 16 (65), No. 1, 2023, p. 41–46, https://doi.org/10.31926/but.shk.2023.16.65.1.5
19. Pal, S.:. *Preventive methods for Karate injuries – a review*. Journal of Clinical and Diagnostic Research, Vol. 14, No. 10, 2020, pp. YE09-YE12, https://doi.org/10.7860/JCDR/2020/45510.14154
20. Patenteu, I., Gawrych, R., et al.: *The role of psychological resilience and aggression in injury prevention among martial arts athletes.* In: Frontiers in psychology, Vol. 15, 2024, p. 1–11, https://doi.org/10.3389/fpsyg.2024.1433835
21. Petre, R. L.: *Combat karate do*. Bucharest, Editura Discobolul, 2014.
22. Piejko, L., Mosler, D., et al.: *Sport Injuries in Karate Kyokushin Athletes.* In: Biomedical Journal of Scientific & Technical Research, Vol. 15(1), februarie 2019, p. 11134-11142, DOI: 10.26717/BJSTR.2019.15.002653
23. Rusu, L., Stănică, V.: *Aspects regarding the psychological preparation of sportsman: precompetitional stress.* In: Gymnasium–Scientific Journal of Education, Sports, and Health, Vol. 10, No. 1, 2009, p. 1–5, https://gymnasium.ub.ro/index.php/journal/article/view/478/611, accessed on 16th March 2025, at 20:50.
24. Smîdu, N., Smîdu, D.: *Importanța cunoașterii factorilor de risc în*

traumatologia sportivă (The importance of understanding risk factors in sports traumatology). In: Revista Marathon, Vol. III, No. 1, 2011, p. 1–9, https://marathon.ase.ro/pdf/vol3/1/NelutaSmidu.pdf, accessed on 15th March 2025, at 08:50.

25. Toma, S., Toma, G.: *Prophylaxis caused by overloading the junior judo player.* In: Gymnasium–Scientific Journal of Education, Sports, and Health, Vol. XVII, No. 2, 2016, p. 1-7, https://ro.scribd.com/document/382512779/63-1-117-1-10-20170817-2, accessed on 16th March 2025, at 16:45.
26. Tudorel, S.: *Ghidul practicantului de karate* – Ediția a II-a revizuită și completată *(The Karate practitioner's guide – 2nd revised and added edition)*. Brașov, Editura Vatra, 2024.
27. Veaceslav, M.: *Optimization of physical, technical-tactical and psychomotor abilities of judo players.* In: Gymnasium–Scientific Journal of Education, Sports, and Health, Vol. XVI, No. 1 Supplementary, 2015, p. 1-7, https://gymnasium.ub.ro/index.php/journal/article/view/125, accessed on 16th March 2025, at 17:00.