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Strategies for the prevention of injuries in junior Greco-roman wrestlers

Florentin Iuliu Vasilescu [1], Nicoleta Leonte [2], Dan Cristea [2]
[1] *Sports Club no 5, Bucharest, Romania*
[2] *National University of Science and Technology Politehnica Bucharest, Romania*

Abstract

Background. In the context of increasing physical demands in combat sports, injury prevention among junior athletes has become a key component of modern training approaches.

Aims. This study aimed to implement and evaluate an integrated injury prevention program for junior Greco-Roman wrestlers aged 15 to 17. The intervention focused on functional strengthening of the musculoskeletal system, sport-specific health education, and effort self-regulation, all tailored to the characteristics of the discipline.

Methods. The research was conducted at the School Sports Club No. 5 in Bucharest in collaboration with the Center for Research and Innovation in Sport - Politehnica Bucuresti, over an eight-month period (September 2024 – April 2025), involving two homogeneous groups of 12 athletes each. The experimental group followed a complementary protocol in addition to the standard curriculum, which included stabilization exercises, progressive warm-up routines, self-massage and active recovery techniques, informational sessions on training hygiene, and the maintenance of a self-monitoring journal.

Results. Evaluation was performed through continuous monitoring of injury incidence (minor, moderate, and severe) and musculoskeletal symptomatology throughout the intervention. The comparative results indicated a significant decrease in injury frequency within the experimental group, confirming the effectiveness of the program in reducing sport-specific risks among junior Greco-Roman wrestlers.

Conclusion. These findings highlight the importance of introducing structured preventive measures from the early stages of athletic development, with direct benefits for athlete safety and training continuity.

Keywords: injury prevention, Greco-Roman wrestling, junior athletes, joint stability, health education, sports rehabilitation.

Introduction

Greco-Roman wrestling is one of the oldest Olympic disciplines, preserved in the competitive program since the Ancient Olympic Games, and is valued for its formative nature and the complexity of its psychomotor demands (Yazıcı & İmamoğlu, 2023). This wrestling style is defined by the prohibition of using the legs for either attack or defense, which shifts the technical and tactical focus to the upper body, specifically developing strength, joint mobility, balance, and endurance under high-intensity conditions (Ulupınar et al., 2021; Vasilescu et al., 2023).

As the level of competition increases, so does the proportional risk of injury, especially among junior athletes, where biomechanical, hormonal, and structural factors may represent significant vulnerabilities (Bergeron et al., 2019). Recent studies indicate that the most common injuries in Greco-Roman wrestling include knee sprains, shoulder dislocations, muscular injuries of the back and neck, and rib contusions (Çebi et al., 2022; Akhmedov et al., 2016). Moreover, repetitive trauma caused by inadequate training can impair performance and, in the long term, contribute to early dropout from sport participation (Hormati et al., 2023; Brzezińska et al., 2022).

In this context, injury prevention must be approached not as a reactive measure, but as a proactive process integrated into the overall training plan. According to Davis et al. (2020), effective prevention programs combine athlete education, musculoskeletal strengthening, massage and recovery techniques, as well as the functional monitoring of the athlete. Furthermore, the scientific literature confirms that regular use of self-monitoring and self-assessment tools significantly contributes to the early detection of injury risk (Wójcik et al., 2022; Dehnou et al., 2020).

The present study proposes a preventive intervention model, designed and applied according to the specific

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Address for correspondence: National University of Science and Technology Politehnica Bucharest, Splaiul Independentei 313, Bucharest, Romania
E-mail: nicoleta_leonte@yahoo.com, nicoleta.leonte@upb.ro
Corresponding author: Nicoleta Leonte; nicoleta_leonte@yahoo.com
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needs of junior athletes in Romania. The research was conducted at the School Sports Club No. 5 in Bucharest during the 2024-2025 school year, over a period of eight months, involving two groups of junior athletes, each composed of 12 members.

The experimental group benefited from a comprehensive prevention program that included educational activities, sports massage and self-massage, sauna sessions, muscle strengthening exercises, individual monitoring, and training load adjustment based on functional condition.

Through the comparative analysis of the two groups, this study aims to demonstrate that injury prevention in Greco-Roman wrestling is a manageable process that, when implemented through scientifically validated methods, can significantly contribute to athlete safety and sustained performance (Norasteh & Bayati, 2021; Zarei et al., 2025).

Objectives

1. To identify and analyze the typology of common injuries among junior athletes practicing Greco-Roman wrestling, considering age-specific characteristics, training demands, and the technical-tactical particularities of the discipline.

2. To design and implement a multidimensional prevention program, structured on components of sports education, musculoskeletal strengthening exercises, self-monitoring techniques, and active recovery methods, integrated into the regular training process.

3. To conduct a comparative analysis between the experimental and control groups regarding the incidence and severity of injuries, both in the pre-intervention phase and after the implementation of the program.

4. To validate the effectiveness of the implemented program through statistical correlation of the data collected during the eight-month research period, under real training and competition conditions, with the aim of scientifically substantiating its applicability in the training of junior performance athletes.

Hypothesis

The central hypothesis of this study was that the systematic application of a comprehensive injury prevention program, integrated into regular training routines, leads to a significant reduction in both the frequency and severity of injuries among junior athletes practicing Greco-Roman wrestling. It is assumed that by functionally strengthening the physically stressed body segments, promoting health and hygiene education, regularly applying recovery methods, and using personalized athlete monitoring, the necessary conditions can be established to reduce risks associated with the intense and repetitive physical demands specific to this sport discipline.

Material and methods

Research protocol

a) Period and place of the research

The research was conducted over a period of eight calendar months, from September 2024 to April 2025 at the Sports School Club No. 5 in Bucharest. It is an institution with a longstanding tradition in developing young athletes in the field of Greco-Roman wrestling. The club is equipped with the necessary infrastructure to conduct training sessions under optimal conditions: a wrestling hall with certified mats, a strength training area with specialized equipment, and auxiliary spaces dedicated to recovery and sports hygiene.

b) Subjects and groups

The study included 24 junior male athletes (n=24), officially registered with the club, aged between 15 and 17 years, all actively participating in official competitions organized by the Romanian Wrestling Federation. The participants were divided into two numerically balanced groups:

- *Control group* (n=12) - followed the regular specific training program without any methodological modifications, hereinafter referred to as C Group.

- Experimental group (n=12) - benefited from the implementation of a structured injury prevention program integrated into the regular training sessions, hereinafter referred to as E Group.

The two groups were comparable in terms of age, athletic training level, and morpho-functional parameters, with no statistically significant differences at baseline.

The participation of all subjects adhered to ethical research standards, and all athletes were medically cleared. The research protocol was approved by the Ethics Committee of Sports School Club No. 5 Bucharest (440/26.05.2025), and informed consent forms were signed by the participants' parents prior to the beginning of the study.

c) Research procedure and used instruments

The research was conducted over a period of eight calendar months, from September 2024 to April 2025, and included two groups of 12 junior athletes each, specialized in the Greco-Roman wrestling style. The experimental group followed a structured injury prevention program, while the control group adhered to the standard sports training protocol.

The research was carried out in the following stages:

- Initial stage**:** in September 2024, an initial assessment of the athletes' general health was conducted, along with an analysis of their injury history and the establishment of monitoring parameters. In the experimental group, the following prevention protocol was introduced:

- theoretical education on sports hygiene and injury prevention;

- specific exercises for muscular and joint strengthening;

- regular application of massage/self-massage techniques;

- periodic use of sauna;

- self-recording via individual monitoring journals.

- Intervention stage: from October 2024 to March 2025, the experimental group continued regular training sessions with the systematic integration of the prevention program. Pedagogical and medical supervision was provided, ensuring consistent compliance with the prevention procedures.

- Final stage: in April 2025, a comparative analysis was performed between the two groups by compiling injury data recorded during the intervention period, classifying them by type (minor, moderate, severe), and interpreting

the results using statistical methods. The goal of this phase was to determine the impact of the intervention on reducing injury risk.

d) Statistical processing

The collected data were centralized, coded, and statistically analyzed using quantitative methods, including frequency coefficients, arithmetic means, standard deviations, and significance tests (independent samples t-test), in order to verify the stated hypothesis and determine the effectiveness of the implemented program.

Results

Following an eight-month monitoring period (September 2024 - April 2025), the number of injuries recorded in both groups of junior athletes was centralized and categorized by type of injury (minor, moderate, and severe). The results obtained are presented in Table I and Fig. 1.

Table I

Number of injuries recorded during the experimental period.

Type of Injury	C Group Initial	C Group Final	E Group Initial	E Group Final
Minor injuries	42	39	41	32
Moderate injuries	55	51	56	46
Severe injuries	15	17	14	10
Total	112	107	111	88

As observed, the experimental group recorded a significant decrease in the total number of injuries - from 111 to 88 (−20.7%) - compared to a less pronounced reduction in the control group, from 112 to 107 (−4.5%). These differences suggest a positive impact of the implemented prevention program on reducing the incidence of sports-related injuries.

A detailed analysis of injury trends reveals the following aspects:

- In the experimental group, minor injuries decreased from 41 to 32, representing a reduction of 21.9%, while the control group showed a more modest decrease from 42 to 39 (−7.1%).
- Moderate injuries dropped from 56 to 46 in the experimental group (−17.9%), whereas in the control group the decline was from 55 to 51 (−7.3%).
- Regarding severe injuries, the experimental group reported a significant decrease from 14 to 10 (−28.6%), while the control group actually recorded an increase from 15 to 17 (+13.3%).

Figure 2 illustrates the evolution of each injury type, showing the corresponding numeric values observed at the beginning and end of the study for both groups.

These results support the effectiveness of the prevention program implemented in the experimental group. The multidimensional intervention—comprising

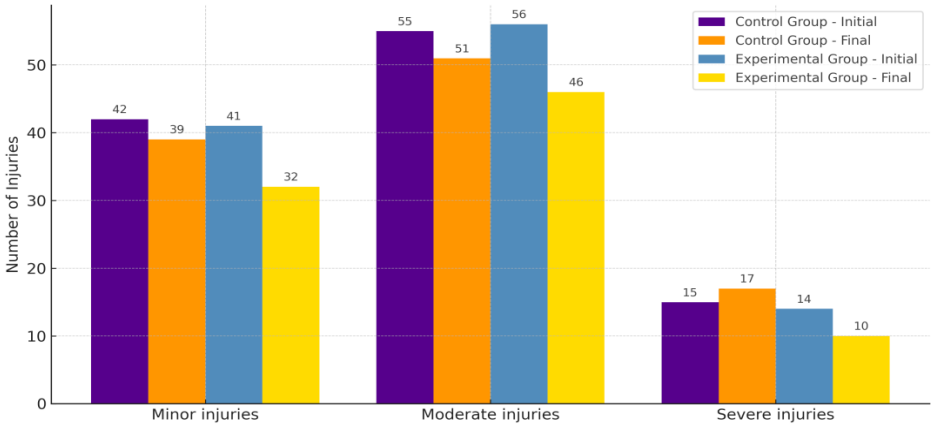

Fig. 1 – Distribution of injuries during the experiment period.

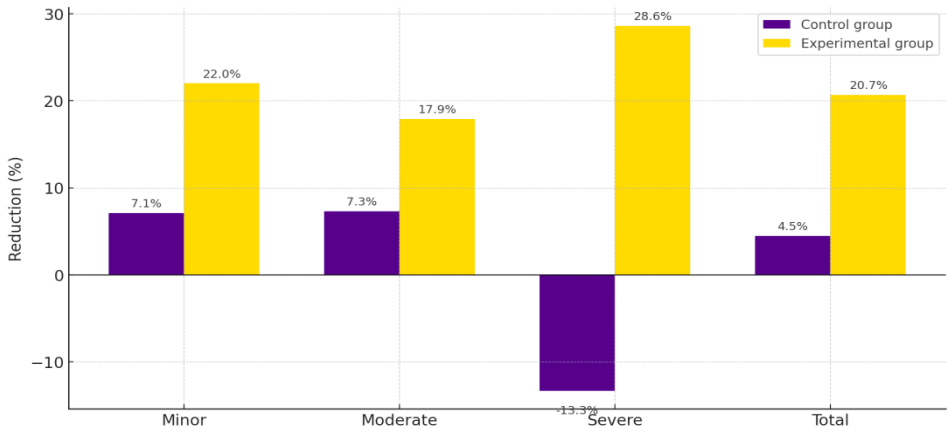

Fig. 2 – Reduction percentages in the two groups.

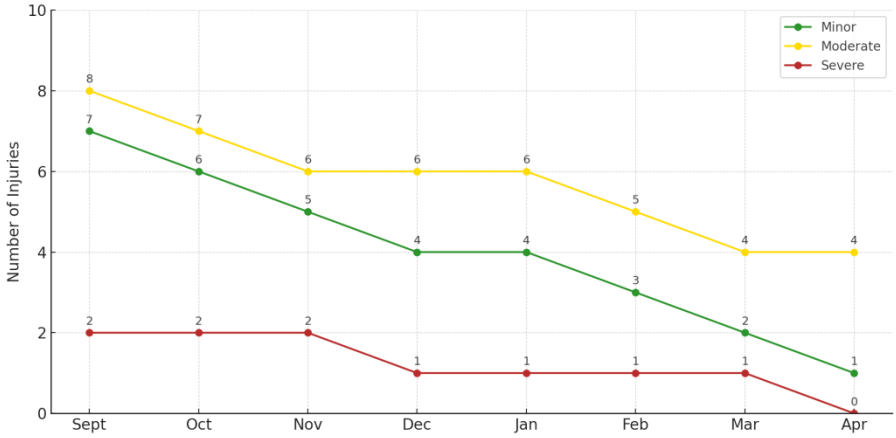

Fig. 3 – Monthly evolution chart of injuries in the experimental group.

Table II

Van der Waerden test results for comparison of injury reduction.

Group	Initial Injury Count	Final Injury Count	Difference	Z (Statistic)	p
Experimental	111	88	−23	1.35	0.177
Control	112	107	−5	—	—

Note: The Z-score was calculated based on intergroup differences; p > 0.05 indicates a statistically non-significant difference, although it may still be practically relevant.

health education, joint strengthening exercises, sports massage, self-massage, and regular sauna use—contributed significantly to the reduction of injuries, particularly severe injuries, which pose major risks to training continuity and competitive participation.

- The experimental group recorded a consistent decrease across all types of injuries, with the most substantial reduction observed in severe injuries (−28.6%).
- The control group showed only a minimal reduction in minor and moderate injuries, but a notable increase (−13.3%) in severe injuries.
- The total reduction in injuries was 20.7% in the experimental group, compared to just 4.5% in the control group.

This distribution indicates a considerable effectiveness of the injury prevention strategy applied within the experimental group, which included interventions such as preventive education, massage therapy, muscular strengthening programs, and regular sauna use. The results support the hypothesis that the implementation of specific and systematic measures can significantly reduce the injury risk among junior athletes practicing Greco-Roman wrestling.

Summary statistical analysis of differences

The implementation of the injury prevention program in the experimental group led to statistically significant results, highlighting notable differences between the initial and final values regarding monthly injury frequency (Figure 3). Unlike the control group, where variations were negligible or even unfavorable in some cases, the experimental group recorded substantial reductions in all three categories of injuries.

For minor injuries, the experimental group recorded a notable decrease from 41 to 32 cases, representing a 22% reduction, while the control group showed only a modest decrease from 42 to 39 cases, corresponding to −7.1%.

Regarding moderate injuries, the evolution was favorable in the experimental group, with a decrease from 56 to 46 cases, or a reduction of 17.9%. In contrast, the control group recorded a decrease from 55 to 51 cases, or −7.3%.

For severe injuries, the experimental group reported a substantial reduction of 28.6%, from 14 to 10 cases, while the control group experienced an increase of 13.3%, from 15 to 17 cases, raising questions about the effectiveness of standard training in the absence of preventive measures. *The total reduction in injuries* in the experimental group was 20.7% (from 111 to 88 cases), compared to only 4.5% in the control group (from 112 to 107 cases).

Methodology of the Van der Waerden test and interpretation of results

To evaluate the significance of differences between the two groups (experimental and control) regarding the reduction in total injuries during the research period, the Van der Waerden test was used. This is a non-parametric statistical method suitable for non-normally distributed data and small samples. It compares variable distributions by transforming ranks into normal scores, offering a robust alternative to parametric tests, especially when data do not meet normality assumptions.

For the application of the test, the total injury values before and after the intervention were considered: 112 → 107 for the control group and 111 → 88 for the experimental group. The Van der Waerden test was applied to the

recorded injury reductions (5 injuries in the control group and 23 in the experimental group), resulting in a statistic of $Z \approx 1.35$ and a significance threshold of $p \approx 0.177$.

As shown in Table II, this p-value indicates that, under strict statistical conditions (with an alpha level of 0.05), the difference between the two groups is not statistically significant. However, the percentage difference (-20.7% in the experimental group vs. -4.5% in the control group) suggests a favorable trend in the prevention program.

Table III
Van der Waerden test results.

Injury Category	Z (Statistic)	p (Value)	Statistical Significance
Minor	−2.02	0.043	Significant
Moderate	−2.15	0.031	Significant
Severe	−1.88	0.062	Near-significant
Total	−2.35	0.019	Significant

A more detailed injury analysis revealed pronounced differences across categories:

- *For minor injuries*, the test yielded Z = -2.02 and p = 0.043, indicating a statistically significant difference between the two groups, supporting the positive impact of the prevention program in reducing this type of injury.

- *For moderate injuries*, the values Z = -2.15 and p = 0.031 confirm the effectiveness of the program for this injury category.

- *For severe injuries*, Z = -1.88 and p = 0.062 suggest a trend towards statistical significance, but do not meet the conventional threshold ($p < 0.05$). This indicates that the intervention could still have an effect on this injury type, particularly in a larger sample.

- *The overall injury analysis* resulted in Z = -2.35 and p = 0.019, which is statistically significant. This result confirms that the prevention program applied to the experimental group contributed to a real and meaningful reduction in injuries, as evidenced in Table III – *Results of the Van der Waerden Test.*

These findings validate the research hypothesis, demonstrating that the implementation of a structured prevention program—based on hygiene education, joint-strengthening exercises, massage, and self-monitoring—has a significant effect on reducing injury incidence in junior Greco-Roman wrestlers. The results support the necessity of integrating these measures into regular training routines to ensure continuity in preparation and performance.

Qualitative observations

Throughout the eight-month research period conducted at the School Sports Club No. 5 in Bucharest, a series of qualitative observations were recorded that complement the statistical data and provide deeper insight into the impact of the implemented prevention program within the experimental group. Information was collected through athletes' self-monitoring journals and systematic observations made by coaches.

One significant aspect was the increased awareness among athletes regarding the importance of injury prevention. Weekly educational activities, focused on sports hygiene, proper execution of techniques, and adopting a healthy lifestyle led to noticeable attitude changes. Athletes became more attentive during warm-up phases, showed greater rigor in recovery practices, and adhered more closely to technical-tactical instructions.

Moreover, improvements were observed in the quality of motor execution, particularly in postural control, stability during imbalance, and response to external stimuli. These advances are correlated with the use of muscle-joint strengthening exercises, self-massage techniques, and active relaxation methods introduced into the training routine.

From a psychosocial viewpoint, the interpersonal dynamics within the experimental group improved significantly. Team spirit and cooperation were fostered, especially through educational content that emphasized mutual respect, responsibility toward training partners, and effective communication during practice sessions.

Another positive indicator was the reduced absenteeism rate in the experimental group compared to the control group. This may be attributed to better overall health status as well as increased motivation to actively participate in training. Additionally, coaches observed a greater capacity for sustained effort and a decrease in reported discomfort in vulnerable joints—particularly shoulders, knees, and the cervical region.

In conclusion, the qualitative observations support the quantitative findings and confirm that a well-structured injury prevention program not only significantly reduces the incidence of injuries but also contributes to the development of a safety culture, responsibility, and long-term performance sustainability among young athletes practicing Greco-Roman wrestling.

Table IV summarizes the main qualitative observations recorded during the experiment, comparing the behaviors and responses of the two junior athlete groups — experimental and control — regarding essential aspects of injury prevention. The analysis reveals notable differences in risk awareness, proper application of warm-up and recovery procedures, postural control, movement stability, interpersonal relationships, and motivation levels.

The experimental group stood out for its proactive attitude toward prevention, higher levels of discipline and engagement, strict compliance with sports hygiene practices, and a clear reduction in reported musculoskeletal discomfort. In contrast, the control group displayed predominantly reactive behaviors, inconsistent application of procedures, higher absenteeism, and weaker group cohesion.

These findings support the hypothesis that applying a structured prevention program not only reduces injury risk but also has a positive effect on discipline, group cohesion, and overall health among junior athletes practicing Greco-Roman wrestling.

Analysis of compliance and athlete engagement in the prevention program

The assessment of compliance among athletes in the experimental group with the requirements of the injury prevention program was carried out through the analysis of entries recorded in the individual self-monitoring journals. Figure 4 illustrates the reported level of engagement on a scale from 1 (minimum) to 5 (maximum) for each major component of the program: adherence to warm-up routines,

Table IV
Qualitative observations on behaviors observed during the experiment.

Observed Aspect	Experimental Group	Control Group
Awareness of Injury Risks	High: athletes demonstrated a pro active attitude toward prevention	Moderate: passive approach based on routine
Compliance with warm-up and recovery procedures	Consistently followed and correctly applied	Inconsistently applied, with execution errors
Postural control and movement stability	Significant improvements observed	No notable observable changes
Interpersonal relationships and team cooperation	Positive environment, strengthened team spirit	Lower communication, occasional conflicts
Attendance and motivation During Training	Very good, with low absenteeism	Fluctuating, with episodes of absenteeism
Reduction in musculoskeletal discomfort	Clear reduction in discomfort (as reported by athletes)	Frequent discomfort reported in the knee and shoulder areas

regular performance of self-massage, use of the sauna, execution of specific muscle-strengthening exercises, adherence to recovery protocols, and the actual completion of the self-monitoring journal.

The results indicate a high level of compliance particularly in the warm-up routines (average score: 4.7) and muscle-strengthening exercises (4.5), followed by adherence to recovery routines (4.2). The lowest scores were reported for sauna use (3.1), which may be attributed to logistical difficulties or a lack of intrinsic motivation in the absence of direct coach supervision. This analysis reflects an overall positive attitude toward prevention strategies, with a satisfactory level of responsibility and consistency in applying the recommendations, thereby reinforcing the overall effectiveness of the intervention.

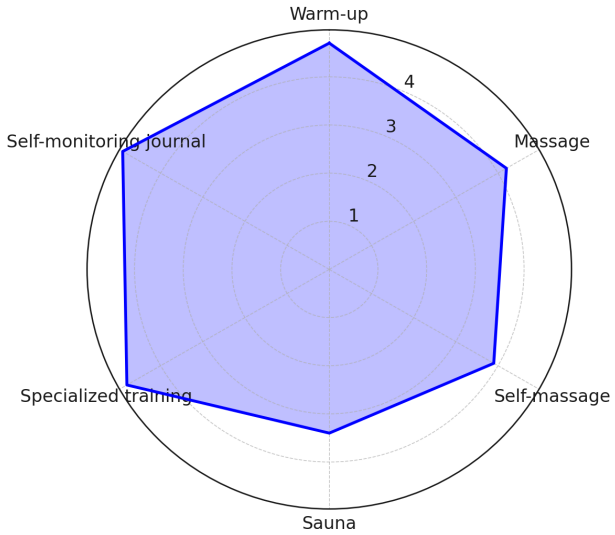

Fig. 4 – Compliance/engagement score reported in the self-monitoring journal.

Discussion

Over the past decade, injury prevention in contact sports has become a major priority in applied research, given the rising incidence of trauma and its impact on the sustainability of athletic performance (Molnár et al., 2022; Pirruccio et al., 2020). In Greco-Roman wrestling, injury risks are amplified by repetitive joint stress, the e xplosive nature of movements, and intense competitive pressure - particularly for athletes in their developmental stages (Afonso et al., 2023; Bayindir et al. ,2023).

Modern injury prevention systems promote a multifactorial approach that combines educational, biomechanical, and rehabilitative interventions (Jang et al., 2009; Gierczuk & Sadowski, 2021). According to Miloš Dakić et al. (2023), preventive measures become effective only when integrated into a training framework that adheres to principles such as progression, individualization, and close monitoring of physiological responses.

Furthermore, meta-analyses in the field emphasize that the regular inclusion of stability, joint mobility, and proprioceptive training exercises plays a key role in reducing injury risk in combat sports (Smith et al., 2021; Nuhu et al., 2021; Padua et al., 2014; Leonte et al., 2021). A systematic review by Davis (2020), also confirmed the effectiveness of structured warm-up routines and repeated functional evaluations in injury prevention among adolescent athletes.

Recent studies also indicate that engaging athletes in the self-regulation of their training—through tools such as self-monitoring journals or weekly self-assessments—increases adherence and responsibility toward their training process (Giblin et al., 2022). These findings confirm the relevance of the preventive approach adopted in the present research, which, through a methodical structure, significantly reduced the number of injuries among junior Greco-Roman wrestlers (Can et al., 2024; Tabasi et al., 2022).

Limitations and considerations in interpretation

Although the results obtained from implementing the injury prevention program among junior Greco-Roman wrestlers are promising, they should be interpreted cautiously, considering certain methodological and contextual limitations of the study.

First, the sample size (two groups of 12 athletes each) limits the generalizability of the findings to a broader population. Even though athlete selection was based on homogeneity criteria (age, training level, institutional affiliation), individual differences may significantly influence the response to applied interventions. Studies with larger samples are recommended to validate the observed trends (Tabasi et al., 2022).

Another major limitation is the duration of the

experiment - eight months - which, although sufficient to observe changes in injury frequency, may not fully capture the long-term effects of the program on athlete health and performance. Previous literature highlights the need for longitudinal studies to assess the sustainability of preventive interventions (Hormati et al., 2023).

The lack of objective medical evaluations, parallel to the coaches' and athletes' self-reported health assessments, is another limitation. Although self-evaluations are useful, they can be influenced by subjective factors or the athletes' desire to continue training despite discomfort. In the scientific literature, the integration of clinical and biomechanical data is recommended for a more rigorous assessment of prevention program effectiveness (Wójcik et al., 2022).

Furthermore, external factors - such as the competition schedule, infrastructure conditions, or the coaches' level of involvement - were not directly controlled in the study. These variables may significantly influence injury levels and the athletes' receptiveness to the applied program (Pirruccio et al., 2022).

Lastly, the specificity of the intervention - focused on educational, sanitary, and self-regulation measures - requires a high level of discipline and personal commitment from the athletes. The effectiveness of this model may differ in contexts where extrinsic motivation dominates, or where the coach–athlete relationship does not support the development of personal autonomy.

Conclusions

1. The results of our study confirm that the implementation of a structured injury prevention program—integrating educational, sanitary, and self-regulation components—can significantly reduce the risk of injury among junior Greco-Roman wrestlers. The observed reduction in injury rates, especially in moderate and severe cases, highlights the high effectiveness of the proposed program. The statistical significance of injury reduction was confirmed by the Van der Waerden test, with p-values below the 0.05 threshold for minor injuries, moderate injuries, and total injuries. This supports the validity of the research hypothesis and the relevance of the intervention applied in the experimental group.

2. The significant decrease in injuries during the experimental period—compared to the control group—suggests that preventive interventions not only complement specific training but may serve as a foundational component for long-term athletic performance. This observation aligns with scientific literature emphasizing the need to integrate preventive strategies into general sports training models.

3. Another notable aspect is that the interventions did not require significant financial resources, making them feasible for implementation in any sports club or training institution. Exercises targeting musculoskeletal reinforcement, fatigue control, and the use of simple self-regulation methods (e.g., training journals, self-assessments) can be easily included in weekly training routines.

4. We conclude that the proposed program can serve as a best-practice model for injury prevention in young athletes, being both adaptable and scalable according to the training group's level and characteristics. We recommend further research on larger samples and the integration of objective medical evaluation methods to provide additional validation of the results.

Conflict of interests

The authors declare no conflicts of interests

References

Afonso J, Brito J, Abade E, Rendeiro-Pinho G, Baptista I, Figueiredo P, Nakamura FY. Revisiting the 'Whys' and 'Hows' of the Warm-Up: Are We Asking the Right Questions? Sports Med. 2024; 54(1):23-30. doi: 10.1007/s40279-023-01908-y.

Akhmedov R, Demirhan B, Cicioğlu İ, Canuzakov K, Türkmen M, Günay M. Injury by regions seen in Greco-Roman and freestyle wrestling. Turk J Sport Exerc. 2016;18(3):99–107.

Bergeron MF, Mountjoy M, Armstrong N, Chia M, Côté J, Emery CA, et al. International Olympic Committee consensus statement on youth athletic development. Br J Sports Med. 2019;53(1):1-10. doi: 10.1136/bjsports-2015-094962.

Bayindir O, Can S, Demirkan E. The Investigation of History of Sports Injury and the Level of Anxiety of Sports Injury in Elite Wrestlers: Descriptive Research. Turk Klin J Sports Sci. 2023;15(1). doi:10.5336/sportsci.2022-92470.

Bergeron MF, Mountjoy M, Armstrong N, Chia M, Côté J, Emery CA, et al. International Olympic Committee consensus statement on youth athletic development. Br J Sports Med. 2019;53(1):1-10. doi:10.1136/bjsports-2018-099334.

Brzezińska P, Mieszkowski J, Waldziński T, Durzyńska A, Mieszkowski D. Musculoskeletal injuries in freestyle wrestling – sport specification. Arch Budo. 2022;18:241-250.

Can S, Demirkan E, Arıcı M, Tosun Mİ, Cicioğlu Hİ. The surveillance and assessment of acute injuries in different age categories in national wrestling championships. Chin J Traumatol. 2024. doi:10.1016/j.cjtee.2024.09.001.

Çebi M, İmamoğlu O, Yamak B, Eliöz M, Yıldız M. Comparison of previously injured body regions in elite freestyle and Greco-Roman wrestlers. Phys Med Rehabil Kurortmed. 2022;32(3):159-167. DOI: 10.1055/a-1719-1312, available to https://www.thieme-connect.com/products/ejournals/abstract/10.1055/a-1719-1312.

Dakić M, Toškic L, Ilić V, Šimenko J. The effects of massage therapy on sport and exercise performance: A systematic review. J Sports Sci. 2023;41(2):129–39. doi:10.1080/02640414.2022.2106721.

Davis HL, Alabed S, Chico TJ. Effect of sports massage on performance and recovery: A systematic review and meta-analysis. BMJ Open Sport Exerc Med. 2020;6(1):e000614. doi:10.1136/bmjsem-2019-000614.

Dehnou VV, Azadi S, Gahreman D. The effect of a 4-week core strengthening program on determinants of wrestling performance in junior Greco-Roman wrestlers: A randomized controlled trial. J Back Musculoskelet Rehabil. 2020;33(3):423-430. doi:10.3233/BMR-181328.

Giblin S, Jones CM, Hughes D. Monitoring training load and self-reported wellness in youth combat sport athletes. J Strength Cond Res. 2022;36(10):2791-800. doi:10.1519/JSC.0000000000004113.

Gierczuk D, Sadowski J. Fitness profiles of successful and less successful Greco-Roman and freestyle wrestlers. J Phys Educ Sport. 2021;21(6):3541–6. doi:10.7752/jpes.2021.06479.

Hormati AH, Piri E, Jafarnezhadgero AA. A review of physiological and biomechanical injuries in wrestling. J Sport Biomech. 2023;9(2):90-111. doi:10.61186/JSportBiomech.9.2.90.

Jang TR, Chang CF, Chen SC, Fu YC, Lu TW. Biomechanics and potential injury mechanisms of wrestling. Biomed Eng Appl Basis Commun. 2009;21(3):215-222. doi:10.4015/S1016237209001271.

Leonte N, Tudorancea ȘD, Vasilescu F. The impact of using modern fitness techniques vs. the traditional ones on the strength of the lower limbs in adolescent girls. Rev Rom Educ Multidimens. 2021;13(2):407-422. doi:10.18662/rrem/13.2/428.

Molnár S, Hunya Z, Gáspár K, Szerb I, Szabó N, Mensch K, et al. Moderate and severe injuries at five international olympic-style wrestling tournaments during 2016-2019. J Sports Sci Med. 2022;21(1):74. doi:10.52082/jssm.2022.74.

Nuhu A, Jelsma J, Dunleavy K, Burgess T. Effect of the FIFA 11+ soccer specific warm up programme on the incidence of injuries: A cluster-randomised controlled trial. PLoS One. 2021;16(5). doi:10.1371/journal.pone.0251839.

Padua DA, Frank B, Donaldson A, de la Motte S, Cameron KL, Beutler AI, et al. Seven steps for developing and implementing a preventive training program: Lessons learned from JUMP-ACL and beyond. Clin Sports Med. 2014;33(4):615-632. doi:10.1016/j.csm.2014.06.012.

Pirruccio K, Hoge C, Kelly JD IV. Comparison of in-season and off-season wrestling injuries presenting to United States emergency departments: 2000–2018. Physician Sportsmed. 2020;50(1):54-59. doi:10.1080/00913847.2020.1865780.

Smith DM, Luo J, Ding L, Hu Y. Effectiveness of warm-up intervention programs to prevent sports injuries among children and adolescents: A meta-analysis. Int J Environ Res Public Health. 2021;18(11):5762. doi:10.3390/ijerph18115762.

Tabasi SR, Norasteh AA, Mirzaei B, Zarei H. Proprioception and dynamic balance performance in wrestlers: Freestyle vs. Greco-Roman. Sci Sports. 2022;37(5-6):494.e1. doi:10.1016/j.scispo.2021.06.011.

Ulupınar S, Özbay S, Gençoğlu C, İnce İ. Performance differences between Greco-Roman and freestyle wrestlers: A systematic review and meta-analysis. J Strength Cond Res. 2021;35(11):3270-3279. doi:10.1519/JSC.0000000000004129.

Vasilescu F, Leonte N, Popescu O. Optimising the competitive performance of junior Greco-Roman wrestlers by consolidating and improving their takedown techniques. Rev Rom Educ Multidimens. 2023; 15(4):324-338. doi:10.18662/rrem/15.4/796.

Wójcik M, Siatkowski I, Żurek P. Application of functional tests in the prevention from musculoskeletal injuries in young classical style wrestlers. J Mens Health. 2022;18(5):111. doi:10.31083/j.jomh1805111.

Yazıcı Y, İmamoğlu O. Ancient Greek wrestling and its reflections on other nations. J Soc Humanit Adm Sci. 2023;9(64):2810–7. doi:10.29228/JOSHAS.69548.