ISSN 2536-569X | eISSN 2536-5703

Journal of Anthropology of Sport and Physical Education

www.jaspe.me

ISSN 2536-569X

JULY 2026

VOL.10
No.3

JASPE

Journal of Anthropology of Sport and Physical Education

Index Coverage
DOAJ; Index Copernicus; ERIH PLUS; Google Scholar; Crossref; ROAD; Open Academic Journals Index; SHERPA/RoMEO; ASCI

Proofreading Service
Danilo Tosic

Prepress
Milicko Ceranic

Print
Art Grafika | Niksic

Print run
550

MontenegroSport

CRNOGORSKA SPORTSKA AKADEMIJA • MONTENEGRIN SPORTS ACADEMY •

ISSN 2536-569X eISSN 2536-5703

JOURNAL OF ANTHROPOLOGY OF SPORT AND PHYSICAL EDUCATION

International Scientific Journal

Vol. 10(2026), No. 3 (1-51)

TABLE OF CONTENTS

Full-text available free of charge at http://www.jaspe.ac.me/

DOI 10.26773/jaspe.260701

Journal of Anthropology of Sport and Physical Education

ORIGINAL SCIENTIFIC PAPER

Differences in the Level of Motor Abilities Between Elementary School Students and Female Athletes

Marija Terzic[1], Bozidar Djukanovic[1], Marina Vukotic[1]

[1]University of Montenegro, Faculty for Sport and Physical Education, Niksic, Montenegro

Abstract

Ever since humans have existed, they have had the need and desire to move. Through physical activity, the cooperation of humans with the natural environment is achieved, and at the same time, physical activity appears as a factor: strengthening health, developing one's physical strength, acquiring motor abilities and habits (Bjelica and Krivokapic, 2019). Motor abilities are responsible for performing of the motor manifestations as a latent motor structure. Their basic division is: strength, speed, coordination, flexibility, balance and precision (Milanovic, 1997). Handball is one of the most popular sports games, which is practiced already in elementary school, and as a top sport, it has also found its place in the Olympic Games (Malic and Tomljanovic, 1982). In this sport, the opportunity is provided for the coordinated development of all muscle groups, various functional potentials are activated, which enable the improvement of all motor abilities (Foretic and Rogulj, 2007). The aim of this research was to determine whether there are differences between the level of motor abilities of handball players and non-athletes. The sample of respondents consisted of 50 girls. The sample was divided into two subsamples. The first sub sample consisted of 25 handball girls from the women's handball club "Nikšić" aged 14 (±6 months). The second subsample consisted of 25 non-athlete girls, students of the "Olga Golović" elementary school, aged 14 (±6 months). The research was carried out through 7 tests to assess the level of motor abilities of the test subjects, namely: 20m run, standing long jump, standing on one leg test, "Sit and Reach" bending test, trunk lifting test, push-ups and hand-hand dynamometry. The results showed that there are statistically significant differences in the level of motor abilities between handball players and non-athletes.

Keywords: *motor abilities, handball, non-athletes, differences*

Introduction

Ever since humans have existed, they have had the need and desire to move. Throught physical activity, the cooperation of humans with the natural environment is achieved, and at the same time, physical activity appears as a factor: strengthening health, developing one's physical strength, acquiring motor abilities and habits (Bjelica and Krivokapic, 2019). Motor abilities are responsible for performing of the motor manifestation as a latent motor structure. Their basic division is: strength, speed, coordination, flexibility, balance and precision (Milanovic, 1997). They are individual and are the result of the physical and mental involvement of an individual. They imply the ability of a person to achieve success in a certain activity as a bio-psycho-social and cultural being (Kukolj, 2006). There is a certain period of life in which the greatest changes are achieved for each motor abilities (Gadzic and Vuckovic, 2012). The development of a person, as well as the development of their motor abilities, is influenced by many internal and external factors. Internal factors depend on the characteristics of participants in the process of physical exercise, while external factors depend on the environment in which physical exercise is performed. Thus, in their ontogenetic development, a person goes through a series of changes conditioned by internal laws of development and environmental influences (Findak, 2001). One of the basic problems of modern times is insufficient movement and excessive obesity among people of all ages. One of the best ways to engage

Correspondence:

Montenegro Sport

M. Terzic
University of Montenegro, Faculty for Sport and Physical Education, Narodne omladine bb, 81400 Niksic, Montenegro
E-mail: terzicmarija11@gmail.com

children in movement, as well as in learning, is play. Play does not represent only entertainment that fills time, but it represents an important part of the lives of babies and children in general. Play is their everyday work and helps them learn and grow. Their overall motivation for play arises from the satisfaction they feel in the process of playing itself (Bjelica and Krivokapic, 2019). In this way, it is much easier and more efficient to engage children and motivate them for activity. Later, children choose various sports or recreational activities in order to fulfill this daily need for movement with the support of their parents, and in this way they develop healthy habits and a healthy lifestyle. Handball is one of the most popular sports games, which is practiced already in elementary school, and as a top sport, it has also found its place in the Olympic Games (Malic and Tomljanovic, 1982). It belongs to complex sports activities when observed from the aspect of structural complexity in the classification of sports (Gruic et al., 2007). In this sport, cyclic and acyclic movement structures dominate, according to which it belongs to the group of complex sports activities (Muratovic et al., 2014). It is a team sport that consists of several different playing positions, each of which has certain specific characteristics in terms of technical and tactical requirements (Poturica, 2014). Also, morphological characteristics differentiate from one position to another, and each position requires certain "desirable" morphological characteristics in order to support and maximize the performance of the player. Handball as a highly complex and engaging sport, effectively sustains children's attention and motivates them toward achievement and increased physical activity. This sport provides opportunities for the balanced development of all muscle groups, while activating various functional capacities that contribute to the enhancement of overall motor abilities (Foretic and Rogulj, 2007).

In order to best demonstrate how much handball positively influences the development of children, in this research we will compare the motor abilities of girls who are handball players with girls of the same age who do not engage in any sport. The general aim of this research is to determine whether there are significant differences between the motor abilities of female handball players and non-athlete girls of elementary school.

Methodology

The sample of participants in this study consists of 50 girls of the same age. The main sample is divided into two subsamples. The first subsample consists of 25 female handball players from the women's handball club "Nikšić," aged 14 (±6 months). The second subsample consists of 25 non-athlete girls, students of the primary school "Olga Golović," aged 14 (±6 months).

It is also important to note that, before the implementation of this research, that is, part of the testing of the test subjects, we received all the necessary consents from the women's handball club, the school and the parents of the test subjects, since it is a sample of test subjects of minor age. The previously realized activities enable the realization of the research itself in accordance with the ethical standards of the University of Montenegro, which precede in the ethical charter, and all in accordance with the recommendations of the Declaration of Helsinki.

The sample of measuring instruments for assessing motor abilities was conducted according to the model by Bala et al. (2007), including: 20m run (A20), standing long jump (ASD), standing on one leg test (ASN), sit and reach test (ASR), trunk lift test (APT), and push-ups (ASK) and hand grip dynamometry (ADS). This battery of measuring instruments was constructed to meet the research's needs and objectives.

The obtained results in this research were processed using descriptive and comparative statistical methods. The statistical significance of differences in selected variables was determined using a t-test for independent samples with a statistical significance level of $p<0.05$.

Results

Table 1 presents the data obtained through the processing of results collected after testing the motor abilities of primary school female students, i.e., non-athletes.

The table displays the basic parameters relevant to this research, allowing for a clearer and more comprehensive analysis of the observed variables. In the column describing the range of results, it can be noted that the largest range is observed in the standing long jump variable (ASD = 71cm), while the smallest range is recorded in the one-leg stance test (ASN = 1).

Table 1. Descriptive statistics of motor abilities of non-athletes.

Variables	N	Min	Max	R	Mean	Sd	Sk	Ku
A20	25	3,00	4,28	1,28	3,78	0,25	-1,14	3,15
ASD	25	134	205	71	175,00	16,29	-0,55	0,42
ASN	25	1	2	1	1,28	0,45	1,04	0,99
ASR	25	1	20	19	12,36	5,55	-0,48	0,66
APT	25	9	19	10	14,64	2,39	-0,20	0,07
ASK	25	1	12	11	5,92	3,04	0,03	0,71
ADS	25	6	25	19	13,04	5,11	0,59	0,41

Legend: N-number of entities; Min-minimum value; Max-maximum value; Sd-standard deviation; R-range; Sk-measure of symmetry (skewness); Ku-measure of peakedness (kurtosis); A20-20m sprint; ASD-standing long jump; ASN-one leg stance test; ASR-sit and reach test; APT-sit up test; ASK-push ups; ADS-handgrip dynamometry

The relationship between the standard deviation and the arithmetic mean is of particular importance, as the standard deviation (Sd) represents a measure of dispersion describing the average deviation of all empirical values from the arithmetic mean.

The parameters Skewnees (Sk) and Kurtosis (Ku) are used to assess deviations from the ideal normal distribution curve. Skewness (Sk) represents a measure of symmetry. By analyzing the column describing skewnees values for all variables, it can be observed that skewness values exceed ±2, and they range from -1,14 to 1,04.

On the other hand, kurtosis (Ku) represents the peakedness of the Gaussian distribution curve. In the column of table 1 describing kurtosis values, it can be observed that the results range from 0,07 to 3,15. Since kurtosis is a measure of the homogeneity of results, the value A20=3,15sec suggests that the Gaussian curve is mesokurtic.

In conclusion, based on the analysis of skewness and kurtosis presented in table 1, the deviation of the Gaussian curve is mini-

mal, except for the 20m sprint variable (A20), where the distribution demonstrates an ideally shaped mesokurtic curve.

Table 2 presents the results of descriptive statistics obtained after processing the results of motor abilities tests conducted on female handball players. The values range from -0,49 to 1,04, leading to the conclusion that skewness values for all variables are close to zero.

Furthermore, examination of the column describing kurtosis (Ku) indicates values ranging from -1,13 to 1,90.

Based on the analysis of skewness and kurtosis across all variables, it can be concluded that their values indicate a normal distribution of results. The deviation of the Gaussian curve is minimal, suggesting that each variable is either slightly flattened or slighty elongated.

Table 2. Descriptive statistics of motor abilities of female handball players

Variables	N	Min	Max	R	Mean	Sd	Sk	Ku
A20	25	2,94	4,20	1,26	3,59	0,25	-0,49	1,90
ASD	25	143	229	86	180,20	20,77	0,29	0,06
ASN	25	1	2	1	1,28	0,45	1,04	-0,99
ASR	25	1	15	14	7,72	4,35	0,03	-1,13
APT	25	14	24	10	18,76	2,48	0,08	-0,12
ASK	25	7	40	33	20,32	8,39	0,54	0,00
ADS	25	2	35	33	15,84	10,69	0,42	-0,91

The results of motor abilities tests for both groups of participants were analyzed using the Students' t-test for independent samples. This procedure provides information that enables comparison and identification of statistically significant differences, where present, between the arithmetic means of motor abilities indicators in non-athlete female students and female handball players. Table 3 presents the arithmetic means for each variable across the two subsamples are presented. The level of statistical significance is expressed as the p-value, where $p \leq 0,05$ is considered statistically significant.

Analysis of the t-test results presented in table 3 reveals statistically significant differences between the two groups of participants in four variables. Specifically, the variables 20m sprint (A20) ($p= 0,01$), Sit and reach test (ASR) ($p\leq 0,01$), sit up test (APT) ($p\leq0,01$), and push-up test (ASK) ($p\leq0,01$) demonstrate statistically significant differences between the arithmetic means of the two groups. In contrast, the p-values for the remaining variables do not indicate statistically significant differences.

Table 3. Differences in motor abilities between subsamples of female handball players and non-athletes (t-test)

Variables	Mean handball players	Mean Students (non-athletes)	t - value	Mean Difference	p
A20	3,59	3,78	-2,61	-0,18	0,01
ASD	180,20	175,00	0,98	5,20	0,33
ASN	1,28	1,28	0,00	0,00	1,00
ASR	7,72	12,36	-3,28	-4,64	≤0,01
APT	18,76	14,64	5,96	4,12	≤0,01
ASK	20,32	5,92	8,06	14,40	≤0,01
ADS	15,84	13,04	1,18	2,80	0,24

Legend: Mean-arithmetic mean; t-t-test value; Mean Difference-difference between arithmetic means; p-significance level of the difference between arithmetic means

Based on the arithmetic mean values, it can be observed that in the 20m sprint test, female handball players achieved a mean value of 3.59, whereas the students recorded a mean value of 3.78. Considering that the objective of the test was to complete the distance in the shortest possible time, the handball players were more successful, as they demonstrated greater speed. As previously noted, this difference is statistically significant.

In the standing long jump test (ASD), the arithmetic mean values indicate that female handball players outperformed the students. In contrast, in the one-leg stance test (ASN), both groups demonstrated equal performance based on their mean values.

The subsample of students performed better than the handball players in the Sit and Reach test (ASR), which, as noted, represents a statistically significant difference. Furthermore, in the sit-up test (ATP), female handball players achieved superior results, with a mean value of 18.76 compared to 14.64 for the students, indicating a statistically significant difference.

Female handball players also demonstrated greater upper-body strength, particularly in the shoulder girdle, as evidenced by higher mean values in the push-up test (ASK) compared to the students. Additionally, based on the results presented in table 3, it can be observed that female handball players were more successful in the final test, handgrip dynamometry (ADS), achieving better results than the students.

Discussion

A review of the previous studies indicates that all tests and results were in favor of female handball players, i.e., athletes, compared to non-athletes. It is evident that athletes are significantly superior and better prepared to respond successfully to all test demands compared to non-athletes.

Thus, in the study conducted by Molnar, Radosav and Smajic (1999), it was concluded that athletes were significantly more successful in tests such as deep forward bend, seated straddle forward bend, frontal split, standing long jump, medicine ball throw from a supine position, 20 m sprint, push-up hold position, sit-ups,

two-leg jumps over a medicine ball, and foot tapping, compared to non-athletes. Furthermore, the study by Batricevic (2008) also demonstrated that athletes achieved significantly better results in tests assessing explosive strength, sprint speed, and coordination. Similarly, a study conducted by Bolanca, Rogulj and Cavala (2011) showed that female handball players were superior in tests of explosive strength and agility, while no significant differences were found in tests of flexibility and repetitive strength. In contrast, the findings of the present study indicate that female handball players performed significantly better in tests of lower limb explosive strength, shoulder girdle strength, and trunk muscle strength, whereas non-athlete students achieved better results in the flexibility test. A possible explanation for this discrepancy is that contemporary handball training programs primarily emphasize the development of strength, power and sport-specific perfoemance, while flexibility training may receive less attention. In the study by Ivanovic M. and Ivanovic U. (2013), the results showed that athletes were significantly more successful than non-athletes across all tests. The authors attributed these differences to long-term training processes. Given that the present study produced similar findings indicating that athletes outperform non-athletes it can also be concluded that these differences are a result of systematic training and a higher level of physical conditioning. Additionally, numerous previous studies (Grabara, 2014; Radu, Popovici and Puni, 2015; Grabara, 2017; Mocanu, Postelnicu, Adam and Popa, 2023) have demonstrated that participation in sports has a significant positive impact on health. Regular training leads to improvements in motor abilities, strengthens muscles, contributes to proper body posture in children, reduces fat mass while increasing lean body mass, and enhances overall well-being, making children more capable of successfully coping with everyday life demands.

One of the limitations of this study is the small sample size, and the battery of tests should have been more extensive. However, the study successfully achieved its objectives.

The findings of the present study are largely consistent with previous research, confirming that athletes are significantly more successful in performing the given tests. It has been demonstrated that the level of motor abilities is higher in female handball players compared to primary school female students, i.e., non-athletes.

Conclusion

In conclusion there are differences in the level of motor abilities between female handball players and non-athletes. When considering the study as a whole and comparing it with previous research, numerous similarities in conclusions can be observed. Athletes are significantly more capable and efficient in performing specific tasks compared to non-athletes. This further emphasizes the many benefits that children can gain through participation in sports.

Received: 07 April 2026; **Accepted:** 19 June 2026; **Published:** 15 July 2026

References

Bala, G., Stojanović, V. M. i Stojanović, M. (2007). *Measurement and Definition of Children's Motor Skills.* Novi Sad: Faculty of Sport and Physical Education.

Batricevic, D. (2008).Canonical Discriminant Analysis of Motor and Functional Skills of Physically Active and Inactive Students. *Sport Science, 1*(1), 50-53.

Bolanca, M., Rogulj, N. i Cavala, M. (2011).Differences in Motor Skills Between Female Handball Players and Non-Athlete Students. *Antrophological aspects of sports physical education and recreation. 2*(1), 170-174.

Bjelica, D., & Krivokapic, D. (2019). *Theory of Physical Exercise and Sport*. Podgorica.

Findak, V. (2001). *Methodology of Physical and Health Education*. Zagreb: School book.

Foretic, N. & Rogulj, N. (2007). Škola rukometa. *Znanstveno-sportsko društvo Grifon*. Split

Gadzic, A., & Vuckovic, I. (2012).Motor Skills of Primary School Female Students from Urban and Rural Areas. *Glasnik Antropološkog društva Srbije, 47,* 131–138.

Gruić, I., Vuleta, D., & Milanovic, D. (2007). Performance indicators of teams at the 2003 Men's World Handball Championship in Portugal. *Kinesiology: International journal of fundamental and applied kinesiology, 38*(2), 164-175.

Grabara, M. (2014). Acomparison of the posture between young female handball players and non-training peers. *Journal of Back and Musculoskeletal Rehabilitation, 27*(1), 85-92.

Grabara, M. (2017). Posture of adolescent male handball players compared to non-athletes. *Baltic Journal of Health and Physical Activity. 9*(3), 76-86.

Ivanovic, M., & Ivanovic, U. (2013). Differences in functional-motor abilities in early adolescent athletes and non-athletes. *Facta Universitatis: Series: Physical Education and Sport, 11*(2), 177-186.

Kukolj, M. (2006). *Anthropomotorics.* Belegrade: Faculty of Sport and Physical Education, University.

Malic, Z., & Tomljanovic, V. (1982).Handball – Theory and Practice. *Sports Tribune.* Zagreb.

Milanovic, D. (1997). *Manual for Sports Coaches.* Faculty of Physical Culture, Zagreb.

Molnar, S., Radosav, R. i Smajić, M. (1999).Analysis of Differences Between Boys Attending a Football Sports School and Boys Not Engaged in Sports in Basic Motor Skills.*Collection of Abstracts. Evaluation of Research Scope in Sport*, str. 174.

Mocanu, G., D., Postelnicu, M., G., Adam, A., M., & Popa, C. (2023). Differences in body composition parameters between female handball players and non-athlete girls during puberty. *Balneo and PRM Resarch Journal. 14*(4), 2-22.

Muratovic, A., Vujovic, D., & Hadzic, R. (2014). Comparative Study of Anthropometric Measurement and Body Composition between Elite Handball and Basketball Players. *Montenegrin Journal of Sports Science and Medicine, 3*(2), 19-22.

Poturica, T. (2014).Handball – That Wonderful Sport. *Matka: časopis za mlade matematičare, 23*(90), 76-79.

Radu, L., E., Puni, A., R., & Popovici, I., M. (2015). Comparison of Anthropometric Characteristics Between Athletes and Non-athletes. *Procedia – Social and Behavioral Sciences. 191*, 495-499.

DOI 10.26773/jaspe.260702

Journal of Anthropology of Sport and Physical Education

SCOPING REVIEW PAPERS

From Biology-Limited to Mechanics-Driven Rehabilitation: A Graft-Specific Framework After Artificial Ligament Reconstruction in ACL, PCL, and Multiligament Knee Injuries

Chikih Chikih[1,3,4], Sapto Adji Hardjosworo[2], Taufan Favian Reyhan[3], Siti Shalihah Suriadiredja[3]

[1]Sports Medicine Residency Training Program, Faculty of Medicine, Universitas Indonesia, Jakarta Pusat, Indonesia, [2]Sports Orthopedics Physician, Ortho-sports and Wellness Center, Premier Bintaro Hospital, Tangerang Selatan, Indonesia, [3]Sports Medicine Physician, Ortho-sports and Wellness Center, Premier Bintaro Hospital, Tangerang Selatan, Indonesia, [4]Center for Sports and Exercise Studies, Indonesia Medical Education and Research Institute, Faculty of Medicine Universitas Indonesia, Jakarta Pusat, Indonesia

Abstract

Artificial ligament reconstruction introduces a paradigm shift in postoperative rehabilitation by reducing biologic constraints and increasing reliance on mechanical load tolerance. This scoping review aimed to develop a clinically applicable, graft-specific rehabilitation framework across ACL, PCL, and multiligament knee injuries. A structured search of PubMed, Cochrane, and Google Scholar (2010–2025) was conducted following PRISMA guidelines. Eleven studies were included and appraised for methodological quality. A consistent transition from biology-driven to mechanics-driven rehabilitation was identified, enabling earlier weight bearing, muscle activation, and strength progression under controlled conditions. Based on these findings, we propose a rehabilitation velocity framework, integrating graft-specific constraints, neuromuscular readiness, and load tolerance to guide progression. Despite accelerated early-phase rehabilitation, return-to-sport decisions remain dependent on objective functional criteria rather than graft type alone. This framework provides clinicians with a structured, criteria-based approach to safely optimize recovery following artificial ligament reconstruction.

Keywords: *Artificial ligament reconstruction; Graft-specific rehabilitation; Rehabilitation velocity; Multiligament knee injury; Return to sport*

Introduction

The anterior cruciate ligament (ACL) is a ligament that stabilizes the knee. Injury to the ACL causes mechanical instability in the knee, which can seriously impact overall quality of life and athletic performance (Sanders et al., 2016). The incidence of ACL injuries is 68.6 per 100,000 people, especially in people who participate in sports that involve cutting, jumping, and sudden landings, such as football and basketball (Montalvo et al., 2019; Sanders et al., 2016). Epidemiologically, women have a risk of injury reaching 2.10/10,000 athletes, especially in collision sports (Montalvo et al., 2019). Meanwhile, in football, the average number of injuries in women reaches 3% and in men 1.6% (Bloch et al., 2025). ACL injuries can occur alone or with multiple ligament injuries, such as those involving the Posterior Cruciate Ligament (PCL). The prevalence of multiple ligament ACL and PCL injuries is 0.072–0.2% of all orthopaedic injuries, but this figure is often underreported because they frequently occur in conjunction with knee dislocations (Ferré-Aniorte et al., 2025; Ng et al., 2020). Reconstructive surgery is a treatment to restore the stability and functional ability of the knee by installing a graft to reconstruct the ACL and PCL (Ostojic et al., 2024). Graft options for the ACL and PCL can come from autografts (tissue from the patient themselves), allografts (donor tissue), and the use of arti-

Correspondence:

Chikih
University of Indonesia, Faculty of Medicine, Sports Medicine Residency Training Program. Salemba Raya No.6, 10430 Jakarat Pusat, Indonesia
E-mail: chikih.md.dma@gmail.com

ficial grafts (Ostojic et al., 2024). This artificial graft is here to provide an alternative graft with the potential for faster recovery (Ardern et al., 2011). The advantages of synthetic grafts include: the absence of another surgical wound at the donor site, unlimited availability, consistent and uniform strength and size, and the potential for shorter rehabilitation times because they do not require extensive biological integration like autografts (Ardern et al., 2011). These synthetic grafts are also used for patients who have previously failed autografts and have the potential to accelerate rehabilitation. Although surgical management can improve mechanical stability in up to 80-90% of cases, the risk of complications such as joint stiffness (arthrofibrosis) and secondary graft failure remains a serious threat. Long-term success depends heavily on precise surgical technique and adherence to an aggressive but measured rehabilitation protocol (Ardern et al., 2011). These conditions collectively result in lost playing and training time of up to 8.7-12.4 months (DeFroda et al., 2021). The success rate of athletes achieving Return to Play (RTP) after multiple ligament injuries and having to undergo combined ACL and PCL reconstruction is lower compared to isolated ACL reconstruction (D'Ambrosi et al., 2024). Studies show that only about 22% to 58% of athletes can return to their original competitive sport level after a multiple ligament injury (D'Ambrosi et al., 2024). This success also depends on the accuracy of surgical technique and adherence to appropriate rehabilitation protocols (van Haren et al., 2025). Therefore, this paper aims to compare and synthesize rehabilitation frameworks following biologic and artificial ligament reconstruction across anterior cruciate ligament, posterior cruciate ligament, and multiple ligament knee injury, and to examine how graft type influences rehabilitation philosophy and progression.

Method

This study was conducted as a scoping review to systematically map and synthesize the available evidence on rehabilitation and conditioning following artificial ligament reconstruction in anterior cruciate ligament (ACL), posterior cruciate ligament (PCL), and multiligament knee injuries (MLKI). The review methodology followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR).

Clinical Questions

Do rehabilitation and conditioning exercise programs following multiple ligament knee reconstruction involving the ACL and PCL using artificial grafts differ from conventional rehabilitation protocols after ACL and PCL reconstruction?

P = Patient ACL, PCL, or MLKI reconstruction

I = Artificial graft

C = Conventional biologic graft

O = Rehab and conditioning exercise protocol (characteristics, progression, and return to sport)

Evidence-based search

A systematic literature search was conducted in PubMed, Cochrane Library, and Scholar for studies published between January 2010 and December 2025 using the PRISMA-ScR flow chart by T.F-R and S.S-R (Figure 1) (Liberati et al., 2009). The search strategy combined Medical Subject Headings (MeSH) and free-text terms as follows: ACL, PCL, multiple ligament knee injury, and artificial graft. Keyword searches were performed using single or combined keywords using the Boolean operators AND and OR, across three article databases (Table 1). For Google Scholar, the first 200 results sorted by relevance were screened. Additionally, reference lists of included studies were manually screened to identify further relevant articles. The conventional rehabilitation protocol, added by the sports medicine team, chose to use the Fowler Kennedy ACL-PCL-Multiple Ligament Injury protocol. (Fowler Kennedy, 2015, 2016a, 2016b), ASPETAR ACL Rehab Protocol (Kotsifaki et al., 2023), and ACL Melbourne Rehab Guide 2.0. Article inclusion and exclusion criteria are based on: (i) article title and abstract containing synthetic graft for multiple ligament injury 2010-2025, (ii) article title and abstract containing treatment and rehabilitation after ACL and PCL reconstruction surgery with synthetic graft, (iii) the article can be accessed in full and uses English, and (iv) the manuscript contains information about the rehabilitation protocol used. Exclusion criteria are based on: (i) the article is a seminar article, (ii) it is not a textbook.

Table 1. Search Strategy

Database	Key Words	Amount
Pubmed	(((((((((Artificial graft) AND (multiligament knee injury)) OR (Artificial graft)) AND (ACL)) OR (Artificial graft)) AND (PCL))) OR (Artificial graft)) AND (ACL)) AND (PCL)	18
Cochrane	Artificial graft Multiligament AND / OR Knee AND / OR Injury "ACL PCL."	0
Shcolar	Artificial graft Multiligament OR Knee OR Injury "ACL PCL."	210

All identified records were imported into a reference manager, and duplicates were removed. Two authors screened titles and abstracts, followed by full-text screening. Disagreements were resolved through discussion and agreement with the 3rd and 4th author. Although critical appraisal is not mandatory in scoping reviews according to PRISMA-ScR recommendations, methodological quality assessment will be performed to provide the strengths and limitations of all selected articles. The selected articles will be critically reviewed based on the study design. AMSTAR-2 will be used for systematic reviews, ROBINS-I for cohort studies, JBI critical appraisal checklist for case series, and SANRA for narrative review and clinical commentaries. C.C and S.A-H conducted all assessments. All the selected articles will undergo data extraction, which includes the researcher's name, year of publication, study type, risk of bias, clinical outcome, applicability, and implications for the rehabilitation phase. A narrative synthesis was performed on rehab and conditioning protocols, focusing on rehab phases, progression criteria, graft-specific differences, and rehab velocity and constant shifts. No data analysis or statistical calculations were performed in this study.

Result

The initial search yielded 228 records (Figure 1). Following the screening and eligibility assessment, 11 studies met the predefined inclusion criteria and were included in the critical appraisal (Table 2). These studies consisted of systematic reviews, cohort studies, case series, narrative reviews, and expert opinion reports, indicating a heterogeneous evidence base with varying methodological rigor and levels of evidence (Table 2).

The methodological quality of the included studies ranged from moderate to high. The systematic reviews and meta-analyses appraised using AMSTAR-2 generally demonstrated moderate methodological quality, primarily limited by heterogeneity in rehabilitation protocols, outcome measures, and the inclusion of predominantly non-randomized studies. The cohort studies assessed using ROBINS-I exhibited a moderate risk of bias, mainly due to selection

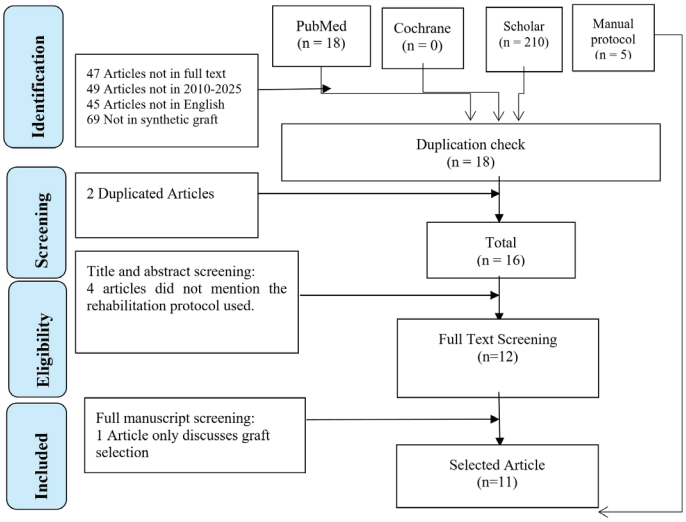


FIGURE 1. Literature Search and Selection Strategy (Prisma Flow Chart)

bias, confounding, lack of randomization, and absence of blinding. The case series evaluated using the JBI Critical Appraisal Checklist demonstrated moderate methodological quality but was limited by small sample size and lack of a comparator group. Narrative reviews and clinical commentaries assessed using SANRA provided valuable conceptual frameworks for rehabilitation but inherently carried a moderate risk of bias because of non-systematic evidence selection and reliance on expert interpretation (Table 2).

Table 2. Critical appraisal table and data extraction

Author (Year)	Study Design & Level of Evidence	Population & Intervention	Internal Validity / Risk of Bias	Clinical Importance (Key Outcomes)	Applicability to Practice	Implications for the Rehabilitation Phase
Arias et al. (Arias et al., 2023)	Systematic review; Level 2a	Patients with multiple ligament knee injury (MLKI) undergoing surgical reconstruction	Moderate risk of bias; limited high-quality comparative trials	Evidence supports the need for prolonged protection and slower progression compared with isolated ACL	Highly applicable for MLKI, including Artificial or hybrid reconstructions	Early: strict protection & controlled ROM; Mid: delayed strengthening; Late: conservative RTS
Migliorini et al. (Migliorini et al., 2022)	Systematic review & meta-analysis; Level 1a	Artificial ACL reconstruction (predominantly LARS)	Low–moderate risk of bias; heterogeneity across included studies	Patient-reported outcomes comparable to autograft; higher incidence of synovitis reported	Supports accelerated but monitored rehabilitation after an Artificial ACL	Early: early ROM & weight-bearing; Mid: faster strength progression; Late: RTS criteria-based
Lee et al. (Lee et al., 2022)	Systematic review; Level 2a	ACL reconstruction, rehabilitation, and return-to-sport criteria	Moderate heterogeneity; rehabilitation protocols varied	Functional and strength-based criteria outperform time-based RTS decisions	Directly applicable to Artificial and biological graft rehabilitation	Late: running, RTS, RTP decisions guided by objective testing
McDonald et al. (McDonald et al., 2021)	Clinical commentary; Level 5	Principles of ACL rehabilitation progression	High risk of bias; non-comparative expert opinion	Highlights the importance of milestone- and criteria-based progression	Useful as a conceptual overlay rather than an evidence driver	All phases: progression based on ROM, strength, and neuromuscular control milestones
Keeling et al. (Keeling et al., 2021)	Narrative review; Level 5	Rehabilitation following multiple ligament knee injury	High risk of bias; narrative synthesis	Emphasizes staged protection and neuromuscular control	Applicable as framework guidance for MLKI rehabilitation	Early: joint protection; Mid: motor control; Late: gradual RTS
Simhal et al. (Simhal et al., 2021)	Retrospective cohort study; Level 3b	Artificial ligament reconstruction of the knee	Moderate risk of bias; lack of randomization and a control group	Demonstrated acceptable stability and early functional improvement	Supports cautious acceleration of rehabilitation	Early–Mid: earlier ROM and closed-chain strengthening with effusion control

(continued on next page)

(continued from previous page)

Table 2. Critical appraisal table and data extraction

Author (Year)	Study Design & Level of Evidence	Population & Intervention	Internal Validity / Risk of Bias	Clinical Importance (Key Outcomes)	Applicability to Practice	Implications for the Rehabilitation Phase
Sun et al. (Sun et al., 2020b)	Retrospective cohort study; Level 3b	Artificial PCL reconstruction compared with autograft	Selection bias present; non-randomized design	Comparable stability with earlier functional recovery in the artificial group	Relevant for tailoring PCL Artificial rehabilitation	Early: anterior-biased ROM; Mid: quadriceps dominance; Late: delayed running
Moreira et al. (Moreira, 2020)	Systematic review; Level 2a	Artificial versus biologic ligament reconstruction	Moderate heterogeneity across included studies	Artificial ligaments tolerate earlier loading than biologic grafts	Strong support for modified, accelerated rehab timelines	Early: earlier weight-bearing & ROM; Mid: accelerated strength progression
Ranger et al. (Ranger et al., 2018)	Case series; Level 4	Artificial PCL reconstruction	High risk of bias; small sample size	Reported safe early ROM and improved posterior stability	Informative for early-phase PCL rehabilitation	Early: controlled ROM; Mid: avoid posterior shear forces
Batty et al. (Batty et al., 2015)	Expert review; Level 5	Biomechanics and clinical considerations of Artificial ligaments	High risk of bias; expert opinion	Describes mechanical behavior and potential complications	Provides a mechanistic rationale rather than protocol guidance	All phases: understand graft load tolerance
Beecher et al. (Beecher et al., 2010)	Prospective cohort study; Level 2b	Artificial ACL reconstruction with early functional rehabilitation	Moderate risk of bias; non-randomized	Demonstrated faster return of function and knee stability	Foundational evidence for accelerated Artificial ACL rehab	Early: early weight-bearing & ROM; Mid: earlier strengthening

Despite differences in study design, a consistent focus was observed on rehabilitation structure, progression criteria, and return-to-sport considerations following artificial ligament reconstruction. All included studies described rehabilitation and conditioning protocols using a phase-based progression model, consistently divided into six phases. Phases I: protection and early activation, phase II: early strength and controlled motion, phase III: progressive strengthening, phase IV: speed and plyometric initiation, phase V: advanced agility and sport-specific training (RTP), and phase VI: return to sport (RTS). The included studies also revealed consistent differences between artificial and biologic graft rehabilitation protocols, particularly in the early phases of recovery. Artificial ligament reconstruction allows earlier progression of loading, motion, and muscle activation under controlled conditions, indicating a shift in rehabilitation constraints from biological healing toward mechanical load tolerance. Based on these findings, a concept of rehabilitation progression velocity is proposed to guide graft-specific rehabilitation strategies. The protocols are structured by time, primary rehabilitation goal, strength, neuromuscular emphasis, and progress criteria. The re-

Table 3. Protocol Reh and Conditioning Exercise After Artificial Graft ACL-R

Phase	Approximate Timeframe	Primary Rehabilitation Goals	Range of Motion and Weight Bearing Strategy	Strength and Neuromuscular Emphasis	Criteria to Progress to Next Phase
Phase I: Protection and Early Activation (Batty et al., 2015; Beecher et al., 2010; Moreira, 2020; Ranger et al., 2018)	Postoperative weeks 0 to 2	Protect the Artificial anterior cruciate ligament graft, control pain and joint effusion, restore full knee extension, and initiate early neuromuscular activation.	Weight bearing as tolerated from the early postoperative period. Knee range of motion progressed toward full extension and flexion up to approximately one hundred and twenty degrees as tolerated.	Quadriceps activation exercises, straight leg raises without extension lag, hip and core stabilization, and early proprioceptive input.	Minimal joint effusion, full passive knee extension, and effective quadriceps activation without extension lag
Phase II: Early Strength and Controlled Motion (Keeling et al., 2021; McDonald et al., 2021; Simhal et al., 2021)	Postoperative weeks 2 to 6	Restore full functional knee range of motion, normalize gait mechanics, and improve early lower limb strength.	Full weight bearing without assistive devices. Progressive achievement of full knee flexion with no restrictions if swelling is controlled	Closed kinetic chain strengthening, bilateral to unilateral lower limb strengthening, and basic balance training	Full knee range of motion, symmetrical gait pattern, and absence of reactive joint effusion

(continued on next page)

(continued from previous page)

Table 3. Protocol Reh and Conditioning Exercise After Artificial Graft ACL-R

Phase	Approximate Timeframe	Primary Rehabilitation Goals	Range of Motion and Weight Bearing Strategy	Strength and Neuromuscular Emphasis	Criteria to Progress to Next Phase
Phase III: Progressive Strengthening (Beecher et al., 2010; Moreira, 2020; Sun et al., 2020a)	Postoperative weeks 6 to 12	Develop symmetrical lower limb strength and enhance neuromuscular control in multiple planes.	Full unrestricted knee range of motion and full weight bearing	Progressive resistance training, unilateral strengthening, frontal and transverse plane neuromuscular training	Quadriceps and hamstring limb symmetry index of at least 70-80% with no post-exercise swelling
Phase IV: Speed and Plyometric Initiation (Arias et al., 2023; Keeling et al., 2021; Lee et al., 2022)	Postoperative months 3 to 4	Introduce running mechanics, speed exposure, and controlled plyometric loading.	Initiation of linear running and acceleration drills with a continued unrestricted range of motion	Low to moderate intensity plyometric exercises, deceleration drills, and reactive neuromuscular training	Hop test performance of at least 75-80% and good movement quality
Phase V: Advanced Agility and Sport-Specific Training (Arias et al., 2023; Migliorini et al., 2022; Simhal et al., 2021)	Postoperative months 4 to 6	Develop advanced agility, cutting ability, and sport-specific movement control.	No restrictions in range of motion or weight bearing	High-intensity plyometric training, change of direction drills, and sport-specific neuromuscular loading	Strength and hop test symmetry of at least 90% with no reactive joint effusion
Phase VI: Return to Sport (Arias et al., 2023; Keeling et al., 2021; Lee et al., 2022)	Postoperative months 6 to 9	Achieve safe and sustainable return to unrestricted sports participation	Full unrestricted participation based on sport-specific demands	Sport-specific conditioning, fatigue-based functional testing, and psychological readiness assessment	Strength and hop performance symmetry of at 90-95%, stable knee function, and confident movement execution

habilitation and conditioning protocols for post-ACL-R with artificial grafts are shown in Table 3.

This also applies to the rehab-conditioning protocols for artificial PCL-R and MLKI (ACL-PCL). Rehab and conditioning protocols after PCL-R and MLKI (ACL-PCL) with Artificial graft are presented in Tables 4 and 5.

Table 4. Protocol Reh and Conditioning Exercise After Artificial Graft PCL-R

Phase	Approximate Timeframe	Primary Rehabilitation Goals	Range of Motion and Weight Bearing Strategy	Strength and Neuromuscular Emphasis	Criteria to Progress to Next Phase
Phase I: Protection and Early Activation (Batty et al., 2015; Beecher et al., 2010; Moreira, 2020; Ranger et al., 2018)	Postoperative weeks 0 to 2	Protect the Artificial posterior cruciate ligament graft, control pain and joint effusion, and prevent posterior tibial sag while initiating early neuromuscular activation.	Weight bearing as tolerated with a brace locked in full extension. Knee range of motion limited to zero to sixty degrees using prone or gravity-minimized positions. Active hamstring contraction is avoided.	Priority quadriceps activation, straight leg raises without extension lag, hip and core stabilization exercises, and ankle pump exercises.	Minimal joint effusion, full passive knee extension, and effective quadriceps activation without extensor lag
Phase II: Early Strength and Controlled Motion (Keeling et al., 2021; McDonald et al., 2021; Simhal et al., 2021)	Postoperative weeks 2 to 6	Restore controlled functional range of motion, improve gait stability, and maintain protection against posterior tibial translation.	Progressive knee range of motion up to ninety degrees. Gradual brace unlocking during ambulation. Full weight bearing with controlled gait mechanics	Closed kinetic chain quadriceps-dominant strengthening, basic balance training, and trunk stability exercises	Knee range of motion of at least 90°, symmetrical gait pattern, and absence of posterior tibial sag

(continued on next page)

(continued from previous page)

Table 4. Protocol Reh and Conditioning Exercise After Artificial Graft PCL-R

Phase	Approximate Timeframe	Primary Rehabilitation Goals	Range of Motion and Weight Bearing Strategy	Strength and Neuromuscular Emphasis	Criteria to Progress to Next Phase
Phase III: Progressive Strengthening (Beecher et al., 2010; Moreira, 2020; Sun et al., 2020b)	Postoperative weeks 6 to 12	Develop symmetrical lower limb strength and improve sagittal and frontal plane neuromuscular control.	Full knee range of motion and unrestricted weight bearing without a brace if posterior stability is maintained	Progressive resistance training with quadriceps dominance, unilateral strengthening, and neuromuscular perturbation training	Quadriceps limb symmetry index of at least 70-80% and no reactive joint effusion following exercise
Phase IV: Speed and Plyometric Initiation (Arias et al., 2023; Keeling et al., 2021; Lee et al., 2022)	Postoperative months 3 to 4	Introduce controlled dynamic loading, impact activities, and linear speed while protecting posterior knee stability.	Initiation of linear running when objective posterior stability is confirmed, with a continued unrestricted range of motion	Low to moderate intensity plyometric exercises, deceleration training, and advanced neuromuscular re-education	Initial hop test performance of at least 75-80% limb symmetry and stable posterior drawer examination
Phase V: Advanced Agility and Sport-Specific Training (Return to Play) (Arias et al., 2023; Migliorini et al., 2022; Simhal et al., 2021)	Postoperative months 4 to 6	Develop high-level agility, cutting ability, and multiplanar sport-specific movement control.	No restrictions in range of motion or weight bearing	Advanced plyometric training, change of direction drills, and reactive neuromuscular control exercises	Strength and hop test symmetry at 90%, and symmetrical performance on dynamic balance testing
Phase VI: Return to Sport (Arias et al., 2023; Keeling et al., 2021; Lee et al., 2022)	Postoperative months 6 to 9	Safe and sustainable return to unrestricted sports participation	Full unrestricted sports participation according to the demands of the specific sport	Sport-specific conditioning, fatigue-based functional testing, and assessment of psychological readiness	Strength and hop performance symmetry of at 90-95%, no joint effusion, and confident sport-specific movement

Table 5. Protocol Reh and Conditioning Exercise After Artificial Graft MLKI (ACL-PCL)

Phase	Approximate Timeframe	Primary Rehabilitation Goals	Range of Motion and Weight Bearing Strategy	Strength and Neuromuscular Emphasis	Criteria to Progress to Next Phase
Phase I: Protection and Early Activation (Batty et al., 2015; Beecher et al., 2010; Moreira, 2020; Ranger et al., 2018)	Postoperative weeks zero to two	Protect the Artificial anterior cruciate ligament and posterior cruciate ligament grafts and control pain and joint effusion.	Weight bearing as tolerated with the brace locked in full extension. Knee range of motion, zero to sixty degrees, using gravity-minimized positions. Active hamstring contraction was avoided.	Priority quadriceps activation, hip and trunk stabilization, straight leg raises without extension lag.	Minimal joint effusion, full passive knee extension, effective quadriceps activation
Phase II: Early Strength and Controlled Motion (Keeling et al., 2021; McDonald et al., 2021; Simhal et al., 2021)	Postoperative weeks two to six	Restore controlled knee range of motion and normalize gait	Progressive knee flexion up to ninety degrees. Gradual brace unlocking. Full weight bearing with controlled gait	Closed kinetic chain quadriceps-dominant strengthening, balance training	Knee range of motion at least ninety degrees, symmetrical gait, no posterior sag
Phase III: Progressive Strengthening (Beecher et al., 2010; Moreira, 2020; Sun et al., 2020b)	Postoperative weeks six to twelve	Develop symmetrical strength and neuromuscular control	Full knee range of motion and unrestricted weight bearing if stability is maintained	Progressive resistance training, unilateral strengthening, and neuromuscular perturbation	Strength symmetry 70-80%, with no reactive joint effusion

(continued on next page)

(continued from previous page)

Table 5. Protocol Reh and Conditioning Exercise After Artificial Graft MLKI (ACL-PCL)

Phase	Approximate Timeframe	Primary Rehabilitation Goals	Range of Motion and Weight Bearing Strategy	Strength and Neuromuscular Emphasis	Criteria to Progress to Next Phase
Phase IV: Speed and Plyometric Initiation (Arias et al., 2023; Keeling et al., 2021; Lee et al., 2022)	Postoperative months three to four	Introduce dynamic loading and controlled impact	Initiate linear running with confirmed anterior and posterior stability	Low to moderate plyometric exercises, acceleration, and deceleration drills	Hop test symmetry 75-80% with stable drawer tests
Phase V: Advanced Agility and Sport-Specific Training (Return to Play) (Arias et al., 2023; Migliorini et al., 2022; Simhal et al., 2021)	Postoperative months four to six	Restore agility and sport-specific control	No restrictions in range of motion or weight bearing	Advanced plyometrics, change of direction drills, and reactive training	Strength and hop symmetry at 90%
Phase VI: Return to Sport (Arias et al., 2023; Keeling et al., 2021; Lee et al., 2022; Migliorini et al., 2022)	Postoperative months six to nine	Achieve safe and sustainable return to sport	Full unrestricted participation according to the sport's demands	Sport-specific conditioning, fatigue-based testing, and psychological readiness	Strength and hop symmetry 90-95% with a stable knee

Comparative synthesis with established biologic graft rehabilitation protocols (Fowler Kennedy, ASPETAR, and Melbourne frameworks) demonstrated that artificial graft protocols are mechanics-driven and response-based, and biologic graft protocols remain biology-driven and time-constrained. Artificial ligament rehabilitation enables earlier exposure to loading and movement and increased rehabilitation velocity in early phases. However, this acceleration requires: strict monitoring of joint response, careful workload progression, and maintenance of movement quality. Comparison of ACL-R rehab protocol between artificial grafts and conventional ACL-R graft from Fowler Kennedy ACL, ASPETAR ACL Rehab Protocol, and ACL Melbourne Rehab Guide 2.0, and the comparison results are shown in Table 6.

Table 6. Comparison of Rehab-Conditioning Protocol Post ACL-R Artificial Graft and Conventional

Phase	Approximate Time Frame	Artificial ACL (Evidence-Synthesized Framework)	Fowler Kennedy ACL Rehabilitation	Melbourne ACL Rehabilitation Guide 2.0	Aspetar ACL Rehabilitation Protocol 2023–2024	Key Clinical Contrast
Phase I: Protection and Early Activation	0–2 weeks	Immediate mechanical stability allows early weight bearing as tolerated, rapid quadriceps activation, and early range of motion progression guided by joint response.	Protection-oriented approach emphasizing effusion control, full extension restoration, and cautious early activation.	Permits weight bearing as tolerated but regulates the range of motion and early loading based on swelling and movement quality.	Highly criteria-driven early phase with progression dependent on pain, effusion, and neuromuscular control.	Artificial ACL rehabilitation is mechanics-driven, whereas biologic protocols remain biology-limited.
Phase II: Early Strength and Controlled Motion	2–6 weeks	Accelerated closed kinetic chain strengthening and earlier attainment of functional range of motion under strict monitoring of joint response.	Gradual strength progression with conservative external loading and predefined time milestones.	Hybrid model combining time-based guidance with movement-quality checkpoints.	Strict criteria are required for progression of strength and loading.	Artificial ACL tolerates earlier controlled loading compared with biologic graft protocols.
Phase III: Progressive Strengthening	6–12 weeks	Earlier neuromuscular and resistance training with rapid progression toward strength symmetry.	Progressive strengthening with delayed exposure to high external loads.	Objective strength testing guides progression but assumes biologic graft vulnerability.	Explicit limb symmetry and strength thresholds are required before advancing intensity.	Limiting factor shifts from graft healing to neuromuscular capacity in artificial ACL.

(continued on next page)

(continued from previous page)

Table 6. Comparison of Rehab-Conditioning Protocol Post ACL-R Artificial Graft and Conventional

Phase	Approximate Time Frame	Artificial ACL (Evidence-Synthesized Framework)	Fowler Kennedy ACL Rehabilitation	Melbourne ACL Rehabilitation Guide 2.0	Aspetar ACL Rehabilitation Protocol 2023–2024	Key Clinical Contrast
Phase IV: Speed and Plyometric Initiation	3–4 months	Earlier initiation of linear running and controlled plyometrics once mechanical stability and movement quality are confirmed.	Running and plyometrics were introduced later, following conservative biologic milestones.	Running is initiated based on movement quality and symptom response.	Running and plyometrics are introduced only after meeting strict biomechanical criteria.	Artificial ACL increases rehabilitation velocity, requiring precise load control.
Phase V: Advanced Agility and Sport-Specific Training (RTP)	4–6 months	Earlier exposure to change-of-direction and sport-specific loading with close workload surveillance.	Conservative progression of agility and sport-specific drills.	Gradual sport-specific exposure with careful volume management.	Highly structured, criteria-based sport progression.	Artificial ACL allows earlier performance exposure but not unrestricted training volume.
Phase VI: Return to Sport (RTS)	≥6–9 months	Potential for earlier return to sport if strict objective criteria are met, although conservative clearance is recommended.	Return to sport is commonly recommended at nine months or later.	Return to sport is guided by functional readiness, but rarely before nine months.	Return to sport requires comprehensive physical and psychological clearance.	All protocols converge on criteria-based return to sport rather than time alone.

The results of the comparison between PCL-R rehabilitation and conditioning with artificial grafts and conventional protocols, as well as the comparison between artificial and conventional ML-KI (ACL-PCL) protocols, are shown in Tables 7 and 8.

Table 7. Comparison of Rehab-Conditioning Protocol Post PCL-R Artificial Graft and Conventional

Phase	Approximate Time Frame	Fowler Kennedy PCL Reconstruction Rehabilitation	Synthetic PCL Reconstruction Rehabilitation (Evidence-Synthesized)	Key Clinical Differences
Phase I: Protection and Early Activation	Postoperative weeks 0–2	Brace locked in extension for ambulation, feather-touch or partial weight bearing, assisted range of motion limited to approximately zero to ninety degrees, strict avoidance of active hamstrings.	External protection recommended with early weight bearing as tolerated, early quadriceps activation, cautious range of motion progression guided by joint response rather than fixed biologic timelines.	Biologic protocol is biology-driven and rule-based, whereas synthetic protocol is mechanics-driven and response-based.
Phase II: Early Strength and Controlled Motion	Postoperative weeks 2–6	Continued bracing, gradual range of motion progression, closed kinetic chain strengthening in limited flexion ranges, hamstrings still restricted.	Earlier restoration of functional range of motion, confident progression of quadriceps-dominant closed kinetic chain strengthening, and hamstrings progressed by criteria.	The synthetic framework allows earlier controlled loading while maintaining posterior shear protection principles.
Phase III: Progressive Strengthening	Postoperative weeks 6–12	Weight bearing as tolerated with normalized gait, full range of motion targeted, cautious introduction of active hamstrings often with brace support.	Accelerated resistance and neuromuscular training, earlier hamstring activation based on posterior tibial control, and movement quality.	Biologic protocol introduces hamstrings based on time rules, synthetic protocol uses control- and tolerance-based criteria.
Phase IV: Speed and Plyometric Initiation	Postoperative months 3–4	Running is delayed until the full range of motion, minimal effusion, and adequate neuromuscular control are achieved.	Linear running and controlled plyometrics may begin earlier once mechanical stability and joint response are acceptable.	Synthetic PCL permits earlier velocity exposure but demands strict monitoring of cumulative load.

(continued on next page)

(continued from previous page)

Table 7. Comparison of Rehab-Conditioning Protocol Post PCL-R Artificial Graft and Conventional

Phase	Approximate Time Frame	Fowler Kennedy PCL Reconstruction Rehabilitation	Synthetic PCL Reconstruction Rehabilitation (Evidence-Synthesized)	Key Clinical Differences
Phase V: Advanced Agility and Sport-Specific Training	Postoperative months 4–6	Advanced strengthening and agility progressed conservatively, and brace use often continued during higher-demand tasks.	Earlier progression to multidirectional drills and sport-specific loading with close fatigue and workload surveillance.	Synthetic framework accelerates performance exposure but requires tighter workload governance.
Phase VI: Return to Sport	Postoperative months 9–12 or later	Return to sport is commonly delayed beyond nine months, emphasizing graft maturation, reinjury prevention, and psychological readiness.	Potentially earlier return to sport if strict objective criteria are met, although conservative clearance remains recommended.	Despite mechanical advantages, return to sport remains criteria-based in both approaches.

Table. 8 Comparison of Rehab-Conditioning Protocol Post MLKI (ACL-PCL) Artificial Graft and Conventional

Phase	Approximate Timeframe	Fowler Kennedy MLKI Rehabilitation	Synthetic MLKI Rehabilitation Framework	Key Clinical Differences
Phase I: Protection and Early Activation	Postoperative weeks zero to two	Strict protection with brace use and restricted weight bearing depending on ligament combination. Early activation is cautious to protect healing grafts.	Early weight bearing as tolerated with rigid external protection. Immediate quadriceps activation with emphasis on joint effusion control.	Biologic protocol is healing-driven; synthetic protocol permits earlier activation due to immediate mechanical stability.
Phase II: Early Strength and Controlled Motion	Postoperative weeks two to six	Gradual progression of the range of motion with restrictions to protect grafts. Strengthening the largely closed kinetic chain.	Earlier restoration of the functional range of motion and more confident progression of closed kinetic chain strengthening.	Synthetic framework allows earlier controlled loading compared with conservative biologic progression.
Phase III: Progressive Strengthening	Postoperative weeks six to twelve	Cautious strengthening progression with delayed limb symmetry expectations.	Accelerated strength and neuromuscular progression with earlier attainment of limb symmetry indices.	Limiting factor shifts from tissue healing to neuromuscular capacity in synthetic MLKI.
Phase IV: Speed and Plyometric Initiation	Postoperative months three to four	Running and plyometrics are delayed or highly restricted due to reinjury risk.	Earlier initiation of linear running and controlled plyometrics if the joint response is stable.	Synthetic MLKI supports earlier speed exposure with strict movement quality control.
Phase V: Advanced Agility and Sport-Specific Training	Postoperative months four to six	Multidirectional and sport-specific drills are introduced cautiously and often later.	Earlier progression to change-of-direction and sport-specific tasks with close fatigue and load monitoring.	Synthetic framework accelerates performance exposure but requires tight workload surveillance.
Phase VI: Return to Sport	Postoperative months nine to twelve or later	Return to sport is delayed with strong emphasis on biological healing, psychological readiness, and reinjury prevention.	Potentially earlier return to sport if objective criteria are met, although conservative clearance remains advised.	Despite mechanical advantages, return to sport should remain criteria-based in both frameworks.

A key thematic pattern identified across all included studies is the transition from a biology-limited to a mechanics-limited rehabilitation model. These findings provide the basis for a clinically applicable, graft-specific rehabilitation framework integrating progression criteria and load management principles.

Discussion

This scoping review demonstrates a consistent shift in rehabilitation principles following artificial ligament reconstruction, characterized by a transition from biologically constrained to mechanically driven rehabilitation. This shift represents not merely a modification of existing protocols but a fundamental change in the underlying rehabilitation paradigm. The comparison between biologic and synthetic anterior cruciate ligament rehabilitation reveals a fundamental philosophical divergence driven by differences in graft biology, mechanical stability, and acceptable rehabilitation velocity (Beecher et al., 2010; Van Melick et al., 2016). Biologic anterior cruciate ligament reconstruction is constrained by ligamentization processes that necessitate cautious loading and delayed exposure to high-velocity activities (Beecher et al., 2010; Van Melick et al., 2016). In contrast, synthetic anterior cruciate ligament reconstruction provides immediate mechanical stability, shifting rehabilitation constraints toward neuromuscular control and load tolerance rather than biological healing (Beecher

et al., 2010; Moreira, 2020). This shift permits earlier activation and strengthening when joint effusion and movement quality are adequately controlled (Beecher et al., 2010; Ranger et al., 2018). A key contribution of this study is the introduction of rehabilitation velocity as a conceptual framework to describe the rate of safe progression through rehabilitation phases. Rehabilitation velocity is influenced by: graft type and mechanical properties, neuromuscular readiness, joint response (e.g., effusion, pain), and load tolerance. This concept provides a clinically meaningful way to reconcile differences between biologic and artificial graft protocols. While biologic grafts impose a fixed biological ceiling, artificial grafts allow a variable, criteria-driven progression, where advancement depends on patient-specific responses rather than predefined timelines. Despite early-phase differences, both approaches converge in later rehabilitation phases, where return-to-sport decisions rely on objective functional criteria rather than graft type alone (Ardern et al., 2011; Buckthorpe & Della Villa, 2020; Zaffagnini et al., 2015).

Biologic posterior cruciate ligament rehabilitation is primarily constrained by the need to protect against posterior tibial translation during graft healing (Fowler Kennedy, 2016a). Protocols emphasize prolonged bracing, restricted weight bearing, and delayed hamstring activation to minimize graft elongation (Fanelli, 2018; Fowler Kennedy, 2016a). Synthetic posterior cruciate ligament reconstruction provides immediate mechanical restraint, allowing earlier quadriceps activation and progression of weight bearing under strict movement control (Beecher et al., 2010; Lee et al., 2022). However, accelerated rehabilitation remains sensitive to excessive posterior shear and cumulative mechanical loading (Lee et al., 2022; Migliorini et al., 2022; Sun et al., 2020a). Ultimately, return-to-sport decision-making converges on functional readiness and joint stability irrespective of graft type (Ardern et al., 2011; Buckthorpe & Della Villa, 2020; Zaffagnini et al., 2015).

Rehabilitation following biologic multiple ligament knee injury reconstruction is heavily constrained by the need to protect multiple healing grafts simultaneously. (Batty et al., 2015; Fanelli, 2018). As a result, biologic protocols prioritize prolonged protection, conservative loading, and delayed exposure to sport-specific demands (Monson et al., 2022; Mook et al., 2009). Synthetic multiple ligament knee injury reconstruction shifts the rehabilitation paradigm toward mechanical load tolerance and neuromuscular control due to immediate graft stability (Batty et al., 2015; Beecher et al., 2010). This allows higher rehabilitation velocity during early phases, although progression must remain tightly regulated to avoid mechanical overload (Batty et al., 2015; Migliorini et al., 2022; Simhal et al., 2021). When compared with established protocols such as Fowler Kennedy, ASPETAR, and Melbourne frameworks, artificial ligament rehabilitation aligns with the broader trend toward criteria-based progression, but differs in its increased rehabilitation velocity during early phases. This suggests that artificial ligament protocols should not replace existing frameworks, but rather extend them by incorporating graft-specific considerations, particularly regarding early loading and progression. Across all graft types, late-phase rehabilitation converges on objective performance metrics, such as limb symmetry indices, neuromuscular control, and psychological readiness to guide optimal return to sports. Importantly, graft type does not appear to determine RTS timing independently. Instead, functional readiness remains the primary determinant, reinforcing the importance of criteria-based rather than time-based progression.

Limitation

This review has several limitations. First, the included studies were heterogeneous in design, with a predominance of lower-level evidence such as case series and expert opinion. Second, variability in reported rehabilitation protocols and outcome measures limited direct comparison across studies. Third, the absence of high-quality randomized controlled trials reduces the strength of causal inference. Additionally, this review relied on narrative synthesis without quantitative meta-analysis due to heterogeneity in study design and outcomes.

Practical Applications Key

Rehabilitation following knee ligament reconstruction has traditionally been guided by biologic graft healing timelines, resulting in conservative, time-based progression models. Although contemporary practice increasingly incorporates functional and criteria-based return-to-sport decision-making, most rehabilitation frameworks remain rooted in biologic constraints. Synthetic ligament reconstruction offers immediate mechanical stability, yet its implications for rehabilitation progression and clinical decision-making remain insufficiently defined and inconsistently applied. This study identifies a fundamental paradigm shift in rehabilitation following artificial ligament reconstruction, characterized by a transition from biology-limited to mechanics-driven progression across ACL, PCL, and multiligament knee injuries. It introduces the concept of rehabilitation velocity as a unifying framework to guide phase progression based on graft-specific mechanical properties, neuromuscular readiness, and joint response, rather than fixed timelines. Furthermore, this study provides a clinically integrated, graft-specific rehabilitation framework that supports earlier progression in early phases while maintaining strict criteria-based advancement and workload regulation. This framework enables clinicians to move beyond uniform, time-based protocols toward a personalized, graft-specific rehabilitation strategy, optimizing early functional recovery without compromising long-term joint integrity. By integrating rehabilitation velocity and objective progression criteria, clinicians can better balance accelerated recovery with safety, ultimately supporting more precise and individualized return-to-sport decision-making in complex knee ligament injuries.

Conclusion

Artificial ligament reconstruction redefines rehabilitation by shifting the primary constraint from biological healing to mechanical load tolerance. This transition enables increased rehabilitation velocity, particularly in early phases, while maintaining the need for strict criteria-based progression. We propose that rehabilitation should no longer be uniformly time-based but instead guided by a graft-specific, velocity-informed framework integrating joint response, neuromuscular control, and objective performance metrics. This paradigm may enhance early functional recovery while preserving long-term joint integrity, offering a clinically actionable model for modern sports rehabilitation.

Declaration of conflict of interest
The authors declare no conflict of interest.

Received: 02 April 2026; **Accepted:** 20 June 2026; **Published:** 15 July 2026

Reference

Ardern, C. L., Webster, K. E., Taylor, N. F., & Feller, J. A. (2011). Return to sport following anterior cruciate ligament reconstruction surgery: a systematic review and meta-analysis of the state of play. *British Journal of Sports Medicine*, *45*(7), 596–606. https://doi.org/10.1136/BJSM.2010.076364

Arias, R., Monaco, J., & Schoenfeld, B. J. (2023). Return to Sport after an Anterior Cruciate Ligament Tear: Bridging the Gap between Research and Practice. *Strength and Conditioning Journal*, *45*(6), 674–682. https://doi.org/10.1519/SSC.0000000000000774

Batty, L. M., Norsworthy, C. J., Lash, N. J., Wasiak, J., Richmond, A. K., & Feller, J. A. (2015). Synthetic devices for reconstructive surgery of the cruciate ligaments: A systematic review. *Arthroscopy - Journal of Arthroscopic*

and Related Surgery, *31*(5), 957–968. https://doi.org/10.1016/j.arthro.2014.11.032

Beecher, M., Garrison, J. C., & Wyland, D. (2010). Rehabilitation following a minimally invasive procedure for the repair of a combined anterior cruciate and posterior cruciate ligament partial rupture in a 15-year-old athlete. *The Journal of Orthopaedic and Sports Physical Therapy*, *40*(5), 297–309. https://doi.org/10.2519/JOSPT.2010.3162

Bloch, H., Krutsch, W., Klein, C., Achenbach, L., & Reinsberger, C. (2025). ACL injuries in professional football (soccer): Women face higher risk, later surgical care and longer time loss compared to men. *Knee Surgery, Sports Traumatology, Arthroscopy : Official Journal of the ESSKA*. https://doi.org/10.1002/KSA.70160

Buckthorpe, M., & Della Villa, F. (2020). Optimising the "Mid-Stage" Training and Testing Process After ACL Reconstruction. *Sports Medicine (Auckland, N.Z.)*, *50*(4), 657–678. https://doi.org/10.1007/S40279-019-01222-6

D'Ambrosi, R., Meena, A., Ursino, N., Di Feo, F., Fusari, N., & Kambhampati, S. B. S. (2024). Return to Sport After Multiligament Knee Injury: A Systematic Review of the Literature. In *Indian Journal of Orthopaedics* (Vol. 58, Issue 11, pp. 1548–1556). Springer. https://doi.org/10.1007/s43465-024-01237-w

DeFroda, S. F., Patel, D. D., Milner, J., Yang, D. S., & Owens, B. D. (2021). Performance After Anterior Cruciate Ligament Reconstruction in National Basketball Association Players. *Orthopaedic Journal of Sports Medicine*, *9*(2). https://doi.org/10.1177/2325967120981649

Fanelli, G. C. (2018). Knee Dislocation and Multiple Ligament Injuries of the Knee. *Sports Medicine and Arthroscopy Review*, *26*(4), 150–152. https://doi.org/10.1097/JSA.0000000000000220

Ferré-Aniorte, A., Bolibar, I., Cugat, R., & Alentorn-Geli, E. (2025). Anterior cruciate ligament injury incidence in male and female soccer players: A longitudinal study over six consecutive seasons. *Knee Surgery, Sports Traumatology, Arthroscopy : Official Journal of the ESSKA*, *33*(12). https://doi.org/10.1002/KSA.70046

Fowler Kennedy. (2015). *Physiotherapy Following Acl Reconstruction Protocol*. *1*(44), 1–15. https://share.google/BlMDwtJe1ajtGxj4k

Fowler Kennedy. (2016a). *Rehabilitation following Posterior Cruciate Ligament Reconstruction (PCLR)*. *November*, 1–4. https://share.google/CvL2Sdj7xhQH4c3kq

Fowler Kennedy. (2016b). *Rehabilitation following surgery for multiligament knee injury (MLKI)*. *November*, 1–4. https://share.google/suTSC8KAZyCAfLysQ

Keeling, L. E., Powell, S. N., Purvis, E., Willauer, T. J., & Postma, W. F. (2021). Postoperative Rehabilitation of Multiligament Knee Reconstruction: A Systematic Review. *Sports Medicine and Arthroscopy Review*, *29*(2), 94–109. https://doi.org/10.1097/JSA.0000000000000308

Kotsifaki, R., Korakakis, V., King, E., Barbosa, O., Maree, D., Pantouveris, M., Bjerregaard, A., Luomajoki, J., Wilhelmsen, J., & Whiteley, R. (2023). Aspetar clinical practice guideline on rehabilitation after anterior cruciate ligament reconstruction. *British Journal of Sports Medicine*, *57*(9), 500–514. https://doi.org/10.1136/bjsports-2022-106158

Lee, J. H. Y., Cook, J. L., Wilson, N., Rucinski, K., & Stannard, J. P. (2022). Outcomes after Multiligament Knee Injury Reconstruction using Novel Graft Constructs and Techniques. *The Journal of Knee Surgery*, *35*(5), 502–510. https://doi.org/10.1055/S-0040-1716356

Liberati, A., Altman, D. G., Tetzlaff, J., Mulrow, C., Gøtzsche, P. C., Ioannidis, J. P. A., Clarke, M., Devereaux, P. J., Kleijnen, J., & Moher, D. (2009). The PRISMA Statement for Reporting Systematic Reviews and Meta-Analyses of Studies That Evaluate Health Care Interventions: Explanation and Elaboration. *PLoS Medicine*, *6*(7), e1000100. https://doi.org/10.1371/journal.pmed.1000100

McDonald, L. K., Cosic, F., & Joseph, S. (2021). The use of the ligament augmentation and reconstruction system for posterior cruciate ligament reconstruction in isolated and multiligament knee injuries: A systematic review. *Knee*, *30*, 322–336. https://doi.org/10.1016/j.knee.2021.04.008

Migliorini, F., Pintore, A., Vecchio, G., Oliva, F., Hildebrand, F., & Maffulli, N. (2022). Ligament Advanced Reinforcement System (LARS) synthetic graft for PCL reconstruction: systematic review and meta-analysis. *British Medical Bulletin*, *143*(1), 57–68. https://doi.org/10.1093/BMB/LDAC011

Monson, J., Schoenecker, J., Schwery, N., Palmer, J., Rodriguez, A., & LaPrade, R. F. (2022). Postoperative Rehabilitation and Return to Sport Following Multiligament Knee Reconstruction. *Arthroscopy, Sports Medicine, and Rehabilitation*, *4*(1), e29–e40. https://doi.org/10.1016/j.asmr.2021.08.020

Montalvo, A. M., Schneider, D. K., Webster, K. E., Yut, L., Galloway, M. T., Heidt, R. S., Kaeding, C. C., Kremcheck, T. E., Magnussen, R. A., Parikh, S. N., Stanfield, D. T., Wall, E. J., & Myer, G. D. (2019). Anterior Cruciate Ligament Injury Risk in Sport: A Systematic Review and Meta-Analysis of Injury Incidence by Sex and Sport Classification. *Journal of Athletic Training*, *54*(5), 472–482. https://doi.org/10.4085/1062-6050-407-16

Mook, W. R., Miller, M. D., Diduch, D. R., Hertel, J., Boachie-Adjei, Y., & Hart, J. M. (2009). Multiple-ligament knee injuries: A systematic review of the timing of operative intervention and postoperative rehabilitation. In *Journal of Bone and Joint Surgery* (Vol. 91, Issue 12, pp. 2946–2957). J Bone Joint Surg Am. https://doi.org/10.2106/JBJS.H.01328

Moreira, J. P. L. (2020). *Rehabilitation of the Acl Using Synthetic Reinforcements: a Biomechanical Study* [University of Porto]. chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://repositorio-aberto.up.pt/bitstream/10216/129069/2/416403.pdf

Ng, J. W. G., Myint, Y., & Ali, F. M. (2020). Management of multiligament knee injuries. *EFORT Open Reviews*, *5*(3), 145. https://doi.org/10.1302/2058-5241.5.190012

Ostojic, M., Indelli, P. F., Lovrekovic, B., Volcarenghi, J., Juric, D., Hakam, H. T., Salzmann, M., Ramadanov, N., Królikowska, A., Becker, R., Prill, R., Ostojic, M., Indelli, P. F., Lovrekovic, B., Volcarenghi, J., Juric, D., Hakam, H. T., Salzmann, M., Ramadanov, N., … Prill, R. (2024). Graft Selection in Anterior Cruciate Ligament Reconstruction: A Comprehensive Review of Current Trends. *Medicina 2024, Vol. 60, 60*(12). https://doi.org/10.3390/MEDICINA60122090

Ranger, P., Senay, A., Gratton, G. R., Lacelle, M., & Delisle, J. (2018). LARS synthetic ligaments for the acute management of 111 acute knee dislocations: effective surgical treatment for most ligaments. *Knee Surgery, Sports Traumatology, Arthroscopy : Official Journal of the ESSKA*, *26*(12), 3673–3681. https://doi.org/10.1007/S00167-018-4940-4

Sanders, T. L., Maradit Kremers, H., Bryan, A. J., Larson, D. R., Dahm, D. L., Levy, B. A., Stuart, M. J., & Krych, A. J. (2016). Incidence of Anterior Cruciate Ligament Tears and Reconstruction: A 21-Year Population-Based Study. *The American Journal of Sports Medicine*, *44*(6), 1502–1507. https://doi.org/10.1177/0363546516629944

Simhal, R. K., Bovich, M., Bahrun, E. A., & Dreese, J. C. (2021). Postoperative Rehabilitation of Posterior Cruciate Ligament Surgery: A Systematic Review. *Sports Medicine and Arthroscopy Review*, *29*(2), 81–87. https://doi.org/10.1097/JSA.0000000000000307

Sun, J., Wei, X. chun, Li, L., Cao, X. ming, Li, K., Guo, L., Lu, J. gong, Duan, Z. qing, Xiang, C., & Wei, L. (2020a). Autografts vs Synthetics for Cruciate Ligament Reconstruction: A Systematic Review and Meta-Analysis. *Orthopaedic Surgery*, *12*(2), 378–387. https://doi.org/10.1111/OS.12662

Sun, J., Wei, X. chun, Li, L., Cao, X. ming, Li, K., Guo, L., Lu, J. gong, Duan, Z. qing, Xiang, C., & Wei, L. (2020b). Autografts vs Synthetics for Cruciate Ligament Reconstruction: A Systematic Review and Meta-Analysis. *Orthopaedic Surgery*, *12*(2), 378–387. https://doi.org/10.1111/OS.12662;PAGE:STRING:ARTICLE/CHAPTER

van Haren, I. E. P. M., van der Worp, M. P., van Rijn, R., Stubbe, J. H., van Cingel, R. E. H., Verbeek, A. L. M., van der Wees, P. J., & Staal, J. B. (2025). Return to sport after anterior cruciate ligament reconstruction - prognostic factors and prognostic models: A systematic review. *Annals of Physical and Rehabilitation Medicine*, *68*(3). https://doi.org/10.1016/j.rehab.2024.101921

Van Melick, N., Van Cingel, R. E. H., Brooijmans, F., Neeter, C., Van Tienen, T., Hullegie, W., & Nijhuis-Van Der Sanden, M. W. G. (2016). Evidence-based clinical practice update: practice guidelines for anterior cruciate ligament rehabilitation based on a systematic review and multidisciplinary consensus. *British Journal of Sports Medicine*, *50*(24), 1506–1515. https://doi.org/10.1136/BJSPORTS-2015-095898

Zaffagnini, S., Grassi, A., Muccioli, G. M. M., Di Sarsina, T. R., Raggi, F., Benzi, A., & Marcacci, M. (2015). Anterior cruciate ligament reconstruction with a novel porcine xenograft: the initial Italian experience. *Joints*, *03*(02), 85–90. https://doi.org/10.11138/JTS/2015.3.2.085

DOI 10.26773/jaspe.260703

Journal of Anthropology of Sport and Physical Education

ORIGINAL SCIENTIFIC PAPER

Teachers' Perspectives on the Role of Physical Education in Promoting Health Culture for Chronic Disease Prevention among Secondary School Students

Kamel Aissat[1], Imed Latreche[2]

[1]Department of sciences and techniques of physical and sport activities, University of Jijel, Algeria, [2]Department of sciences and techniques of physical and sport activities, University of Sétif 2, Algeria

Abstract

The present study aimed to examine the views of secondary school teachers in Jijel Province, Algeria, regarding the role of physical education in promoting health culture for the prevention of chronic diseases among students. A total of 42 secondary school teachers from Jijel Province responded to an online questionnaire covering four dimensions: Curriculum content and cognitive aspects related to disease prevention, Students' health awareness, Teaching methods and motivation for disease prevention, and Pedagogical, structural, and temporal barriers. Responses were collected using a five-point Likert scale. Descriptive statistics were calculated for the overall dimensions and for each dimension separately. The results showed neutral responses for the first two dimensions, Curriculum content and cognitive aspects related to disease prevention and Students' health awareness, with mean scores of 3.02 and 3.10, respectively. In contrast, teachers expressed agreement with the dimensions Teaching methods and motivation for disease prevention and Pedagogical, structural, and temporal barriers, with mean scores of 3.70 and 4.01, respectively. Overall, the findings suggest that while teachers show strong motivation to promote health-related behaviors, the curriculum content and students' health awareness remain moderate. In addition, structural and logistical barriers such as limited facilities, overcrowded classes, and time constraints represent major challenges that limit the effective implementation of health-oriented physical education.

Keywords: *Physical Education, curriculum, health care, chronic disease, secondary school*

Introduction

Health is widely recognized as a multidimensional state of optimal well-being, encompassing physical, mental, emotional, social, and intellectual domains (Viner, & Macfarlane, 2005). It goes beyond the mere absence of disease, reflecting an individual's capacity to adapt to and manage life challenges. Health promotion, in this context, involves enabling individuals to adopt lifestyle behaviors that support the maintenance and enhancement of overall well-being. It is an active process that empowers people to take responsibility for their own health and make informed choices (Hof-Nahor, Biswas, 2020).

However, when this state of optimal functioning is disrupted, disease emerges as a condition of physiological or psychological imbalance that impairs normal functioning. Among the various forms of disease, chronic noncommunicable diseases have become particularly concerning in recent decades. Over the past decades, chronic diseases such as obesity, type 2 diabetes, hypertension, and cardiovascular disorders have emerged as major public

Correspondence:

Montenegro Sport

K. Aissat
Department of Sciences and Techniques of Physical and sports activities, Faculty of Human and social sciences, University of Jijel, Algeria, BP 98, Jijel, Algeria
E-mail: kamel.aissat@univ-jijel.dz

health challenges worldwide (Chengyu et al., 2024). According to the World Health Organization (2025), noncommunicable diseases killed at least 43 million people in 2021, accounting for approximately 75 % of all non-pandemic deaths globally. Of these, about 18 million occurred before the age of 70, and major contributors included cardiovascular diseases, cancers, chronic respiratory diseases, and diabetes. Once considered primarily adult conditions (Warsy & el-Hazmi, 1999), these non-communicable diseases are increasingly observed among adolescents and young adults (Watson et al., 2022). Sedentary behaviors, poor dietary habits, and insufficient physical activity are key contributors to this trend, leading to the early onset of health complications and increased long-term risks (World Health Organization, 2025).

Physical activity is recognized as one of the most effective protective factors against chronic diseases. Regular participation in moderate-to-vigorous physical activity improves cardiovascular and metabolic function, supports weight management, and enhances mental well-being. In contrast, physical inactivity is now considered a leading global health risk factor (Anderson, & Durstine, 2019). In this regard, the World Health Organization recommends that adults engage in at least 150–300 minutes of moderate-intensity physical activity per week, or 75–150 minutes of vigorous-intensity activity, to achieve substantial health benefits and reduce the risk of noncommunicable diseases (World Health Organization, 2020). Promoting active lifestyles from a young age is therefore essential to prevent the early development of chronic conditions.

Within schools, physical education (PE) plays a role in promoting students' physical and mental well-being (Ramires et al., 2023). Beyond its traditional focus on sports and motor skill development (Jiang et al., 2025), PE has the potential to foster students' health knowledge, awareness, and preventive competencies. However, research suggests that the preventive health role of PE is often underrealized in practice. Evidence based on perceptions of secondary school teachers and students indicates certain limitations in this regard. For instance, a study conducted among secondary school teachers in England found that, despite policy discourse emphasizing health promotion, PE practice remained largely sport- and performance-oriented (Green & Thurston, 2002). Similarly, research involving upper secondary school students in Norway reported limited perceived development of health competence through PE classes (Haga et al., 2024). As these findings are grounded in specific European educational contexts, perceptions of PE's health-promoting role may vary across different educational systems and cultural settings, including regions in Africa, the Middle East, Asia, and other developing or transitional contexts where curricular priorities, institutional resources, and socio-cultural expectations may differ substantially.

In order to examine the extent to which physical education contributes to promoting health culture for the prevention of chronic diseases in Algeria, the present study explores the interaction between the educational curriculum and the health context. Specifically, it aims to determine the extent to which the secondary school physical education curriculum equips students with the necessary health and preventive competencies to address chronic diseases, to assess the level of health awareness among this population, and to identify the pedagogical and structural barriers that may hinder the achievement of the intended preventive objectives.

Materials and methods

Participants

A total of 42 physical education teachers working at the secondary school level in Jijel Province, Algeria, participated in the present study during the 2025–2026 academic year. Participants were contacted via social media platforms and invited to complete the questionnaire. Most participants were aged between 31 and 40 years (n = 30, 71.4%), followed by those aged 41–50 years (n = 8, 19%) and 24–30 years (n = 4, 9.5%). Regarding educational level, 31 teachers held a Master's degree (73.8%) and 11 held a Doctoral degree (26.2%). In terms of teaching experience at the secondary level, 17 participants had 11–15 years of experience (40.5%), 10 had 1–5 years (23.8%), 9 had 6–10 years (21.4%), 5 had 16–20 years (11.9%), and 1 had more than 20 years of experience (2.4%). Informed consent was obtained from all participants prior to data collection, and the study was conducted in accordance with the ethical principles of the Declaration of Helsinki (World Medical Association, 2013).

Study Design

This is a descriptive cross-sectional study aimed at exploring secondary school teachers' perspectives on the role of physical education in promoting health culture for the prevention of chronic diseases among students. Data were collected using a questionnaire, which was specifically designed and distributed to secondary school teachers in Jijel Province, Algeria, between 17 and 28 February 2026. The questionnaire, included both single-choice items and five-point Likert scale questions. Completion of the questionnaire required approximately 10 minutes.

Data collection method

Data were collected using a questionnaire developed by the researchers specifically for the purposes of this study. The instrument was constructed based on a comprehensive review of relevant literature and similar previous studies (Green & Thurston, 2002). The questionnaire was divided into six sections. The first section addressed participation in the study, in accordance with research ethics. The second section collected demographic information through three single-choice questions. The third section included four questions on curriculum content and cognitive aspects related to disease prevention. The fourth section comprised three questions on students' health awareness from the teachers' perspective. The fifth section contained four questions on teaching methods and motivation for disease prevention, while the sixth section included four questions on pedagogical, structural, and temporal barriers. All items used a five-point Likert scale ranging from "Strongly Agree" to "Strongly Disagree." To establish its face and content validity, the instrument was thoroughly reviewed by a panel of experts specialized in physical education, ensuring the clarity and relevance of all items. Furthermore, internal consistency of the questionnaire was assessed using Cronbach's alpha ($\alpha = 0.82$), and test–retest reliability evaluated on a pilot sample of six teachers yielded a high correlation ($r = 0.78$).

Statistical analysis

After downloading the responses from Google Forms, the data were organized using Microsoft Excel 2013. Descriptive statistics for demographic variables were presented as frequencies and percentages, while responses to the five-point Likert scale items were summarized as means ± SD. The internal consistency of the questionnaire was assessed using Cronbach's alpha, and test–retest reliability was evaluated using the Pearson correlation coefficient on a pilot sample of 06 teachers who completed the questionnaire twice with a six-day interval. The level of statistical significance was set at $p \leq 0.05$. All analyses were performed using Microsoft Excel and IBM SPSS Statistics (Version 26).

Results

Tables 1–5 and Figure 1 present the descriptive statistics and response distributions for all questionnaire items.

Overall Results of the Questionnaire

Table 1 presents the descriptive statistics for the questionnaire dimensions. The highest mean score was observed for Pedagogical, Structural, and Temporal Barriers (Mean = 4.01, SD = 0.79), followed by Teaching Methods and Motivation for Disease Prevention (Mean = 3.70, SD = 0.87), both indicating agreement among participants. In contrast, Students' Health Awareness (Mean = 3.10, SD = 1.10) and Curriculum Content and Cognitive Aspects Related to Disease Prevention (Mean = 3.02, SD = 1.09) showed neutral levels of agreement.

Table 1. Descriptive Statistics for the Questionnaire Dimensions

Dimensions	Sample (n)	Mean	SD	%	Level of agreement
Curriculum content and cognitive aspects related to disease prevention	42	3.02	1.09	60.4	Neutral
Students' health awareness		3.10	1.10	62	Neutral
teaching methods and motivation for disease prevention		3.70	0.87	74	Agree
pedagogical, structural, and temporal barriers		4.01	0.79	80.2	Agree

Note: SD: Standard Deviation

Results by Dimension

Table 2 presents the item-level results for Dimension 1. All items showed neutral levels of agreement, except for the item related to curriculum flexibility (Mean = 3.40, SD = 1.07), which indicated agreement. The lowest mean scores were observed for the items addressing the coverage of exercise physiology content and explicit instructional units linking physical activity to chronic disease prevention (both Mean = 2.81), reflecting moderate perceptions regarding the adequacy of curricular content in supporting preventive health objectives.

Table 2. Descriptive Statistics of the Items of Dimension 1: Curriculum Content and Cognitive Aspects Related to Disease Prevention

Questions	Sample (n)	Mean	SD	%	Level of agreement
The current physical education curriculum adequately covers the theoretical aspects related to the physiology of physical exertion	42	2.81	1.03	56.2	Neutral
The curriculum includes explicit instructional units that link physical activity to the prevention of chronic diseases		2.81	1.07	56.2	Neutral
The theoretical lessons included in the curriculum contribute to building a solid health knowledge base among students, beyond the competitive aspect		3.07	1.08	61.4	Neutral
The curriculum provides flexibility that allows the teacher to focus more on the physical preventive aspect rather than on the technical skills of team sports		3.40	1.07	68	Agree

Note: SD: Standard Deviation

Table 3 shows the results for Dimension 2. All items demonstrated neutral levels of agreement. The highest mean score concerned students' interest in health information (Mean = 3.26, SD = 1.14), followed closely by awareness of the relationship between exercise intensity and physiological improvement (Mean = 3.24, SD = 1.11). The lowest mean was recorded for students' awareness of the risks of physical inactivity (Mean = 2.81, SD = 1.01), indicating moderate perceptions of students' overall health awareness.

Table 3. Descriptive Statistics of the Items of Dimension 2: Students' health awareness

Questions	Sample (n)	Mean	SD	%	Level of agreement
Students possess sufficient health awareness regarding the risks of physical inactivity and its relationship to diseases	42	2.81	1.01	56.2	Neutral
Students are aware of the direct relationship between the intensity of physical activity and the improvement of cardiovascular and respiratory functions		3.24	1.11	64.8	Neutral
Students show as much interest in the health information provided by the teacher as they do in playing and competing		3.26	1.14	65.2	Neutral

Note: SD: Standard Deviation

Table 4 presents the results for Dimension 3. Most items showed agreement, particularly the use of dialogical methods (Mean = 4.07, SD = 0.59) and strategies promoting physical activity as a daily lifestyle (Mean = 3.93, SD = 0.51). The allocation of time to link activities with health benefits also indicated agreement (Mean = 3.43, SD = 0.93). However, the item related to the availability of educational tools showed a neutral level of agreement (Mean = 3.38, SD = 1.09).

Table 4. Descriptive Statistics of the Items of Dimension 3: teaching methods and motivation for disease prevention

Questions	Sample (n)	Mean	SD	%	Level of agreement
In my teaching, I rely on strategies that encourage students to make physical activity a daily "lifestyle" beyond the school environment	42	3.93	0.51	78.6	Agree
The available educational tools (brochures, posters, heart rate monitors, etc.) contribute to enhancing students' motivation toward preventive learning		3.38	1.09	67.6	Neutral
I allocate sufficient time at the end of each lesson to connect the physical activity performed with the health benefits achieved		3.43	0.93	68.6	Agree
The dialogical method and discussion play an effective role in persuading students to adopt lasting healthy behaviors		4.07	0.59	81.4	Agree

Note: SD: Standard Deviation

Table 5 presents the findings for Dimension 4, which showed consistent agreement across all items. The highest mean score was observed for the lack of sports facilities and equipment (Mean = 4.21, SD = 0.71), followed by class overcrowding (Mean = 4.19, SD = 0.70). The weekly contact hours (Mean = 3.81, SD = 0.85) and lack of specialized training courses (Mean = 3.83, SD = 0.81) also indicated agreement, highlighting the perceived impact of structural and organizational barriers.

Table 5. Descriptive Statistics of the Items of Dimension 4: pedagogical, structural, and temporal barriers

Questions	Sample (n)	Mean	SD	%	Level of agreement
The weekly contact hours (two hours) prevent reconciling the completion of the curriculum with the achievement of preventive health objectives	42	3.81	0.85	76.2	Agree
The lack of sports facilities and equipment constitutes an obstacle to implementing certain instructional units with a preventive focus		4.21	0.71	84.2	Strongly Agree
The high student-to-class ratio hinders the accurate monitoring of each student's physical health status		4.19	0.70	83.8	Agree
The teacher lacks specialized training courses on how to teach "Physical Education for Health" instead of purely "Sports-Based Physical Education"		3.83	0.81	76.6	Agree

Note: SD: Standard Deviation

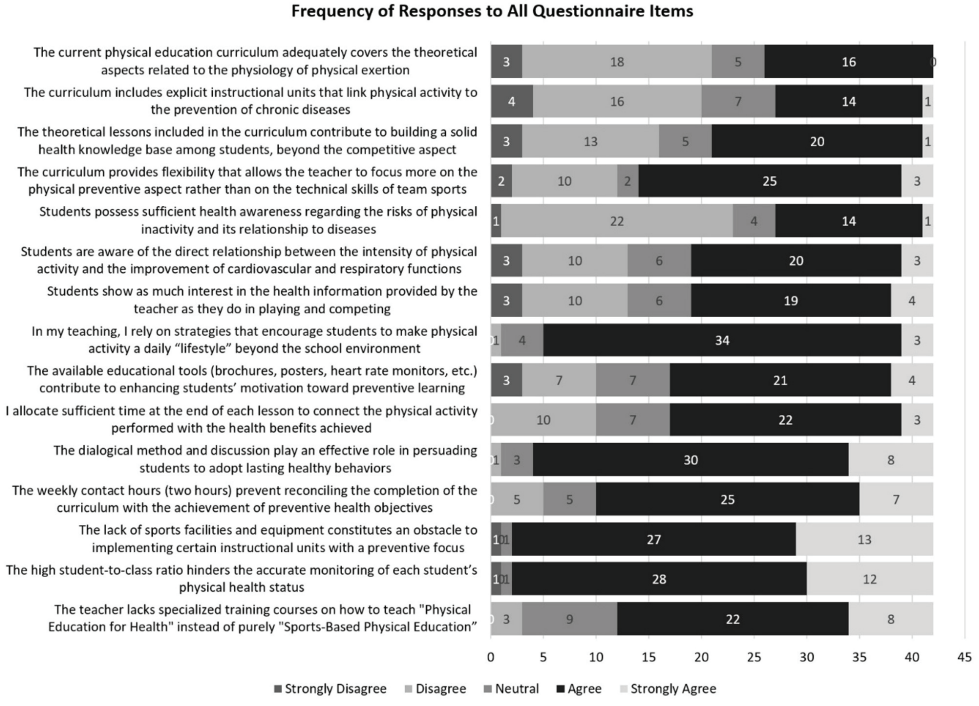


FIGURE 1. Literature Search and Selection Strategy (Prisma Flow Chart)

Discussion

The aim of this study was to examine the perspectives of secondary school teachers in Jijel Province, Algeria, regarding the role of physical education in promoting health culture and preventing chronic diseases among students. The results reveal that the work environment is the most important factor limiting the implementation of health-related aspects in the physical education curriculum. The high mean score (4.01) for pedagogical, time, and structural barriers indicates that teachers face significant difficulties in applying the health dimension of the curriculum. Limited time and weak infrastructure reduce the effectiveness of physical education classes and often limit them to simple physical activities instead of using them as a strategic tool to promote health culture. These findings are consistent with Hardman (2008), who reported that the marginalization of physical education in school schedules and the lack of resources reduce its ability to produce sustainable health outcomes. In addition, the relatively low standard deviation (0.79) suggests that teachers have similar views about these barriers, indicating that they are common challenges in secondary schools in Jijel. Despite these structural barriers, the results reveal a relatively strong level of professional awareness among teachers. The mean score for teaching methods and motivation (3.70) suggests that teachers try to use different teaching strategies to encourage healthy behaviors among students. This may be related to the high academic level of many teachers (Master's and PhD degrees). Teachers are not only providing health information but also trying to develop sustainable health behaviors through improved teaching approaches. This finding is consistent with Haerens et al. (2011), who emphasized that teaching styles that support student autonomy can increase students' motivation to adopt an active lifestyle.

However, the comparison between these two results shows an important gap. Teachers demonstrate strong pedagogical motivation, but they work in a limited structural environment. This contradiction may create professional stress for teachers if these conditions are not improved by educational authorities.

The results also indicate some methodological limitations in the secondary school physical education curriculum. Neutral responses related to concepts of exercise physiology and preventive education suggest that there is a gap between physical practice and scientific understanding. The lowest mean score (2.81) was recorded in items related to exercise physiology, which suggests that the Sport-Education Model dominates the curriculum more than the Health-Related Fitness Model. As a result, students may practice physical activity without clearly understanding its scientific and health benefits. This may prevent physical activity from becoming a long-term health habit that helps prevent chronic diseases (Haerens et al., 2011).

At the same time, curriculum flexibility appears as a positive aspect, with a mean score of (3.40). Teachers feel that they have some freedom to adapt their teaching methods and introduce health topics. However, this flexibility can also be problematic because it depends mainly on the individual teacher's competence to compensate for the absence of explicit curriculum units related to issues such as obesity and diabetes. Therefore, developing an effective preventive curriculum requires integrating these topics clearly into the official program and linking physical activity with health knowledge (Metzler, 2017).

Overall, the results suggest that teachers show good professional readiness and motivation, but the curriculum still lacks strong scientific content related to exercise physiology and health prevention. The results related to students' health awareness and motivation provide further insights. The findings show that students generally gave neutral responses, indicating moderate or unstable awareness of the importance of physical activity. Although interest in health information recorded the highest mean (3.26), followed by awareness of the relationship between physical effort and physiological improvement (3.24), these values remain close to the neutral level. This suggests that students' knowledge about health is still superficial and has not yet developed into strong behavioral beliefs. The lowest mean score was found for awareness of the risks of physical inactivity (2.81), which indicates a concerning lack of understanding of the dangers of sedentary lifestyles. Many students may therefore participate in sports mainly for school requirements or recreation, rather than for health reasons.

These findings are consistent with Sallis et al. (2012), who argued that having health information does not automatically lead to an active lifestyle unless individuals understand the risks of physical inactivity. The variation in students' responses (standard deviation between 1.01 and 1.14) also suggests differences in social and cultural influences, indicating that students' health awareness is shaped not only by school but also by external factors. Similarly, Biddle & Asare (2011) found that adolescents often focus on immediate outcomes such as enjoyment or appearance rather than long-term health benefits.

Overall, the results suggest that students have limited health awareness. They show some interest in health information but do not fully understand the long-term risks of inactivity. Therefore, the physical education curriculum should move from simply providing knowledge to encouraging healthy behaviors, by linking physical activities with real health issues.

The results also show that pedagogical, structural, and time constraints are the main obstacles to implementing the health dimension in physical education. The results reveal strong agreement among teachers regarding these challenges. The lack of facilities and equipment recorded the highest mean score (4.21), followed by overcrowded classes (4.19). These results indicate that teachers work in difficult physical conditions that limit the effectiveness of physical education classes. In such environments, the teacher may focus mainly on maintaining order rather than developing students' physical and health competencies.

The problem is not limited to infrastructure. Teachers also reported limited teaching time (3.81) and lack of specialized training (3.83). These conditions reduce teachers' ability to focus on preventive health education. These results support the conclusions of Hardman (2008), who highlighted the gap between educational policies and the reality of limited resources. They also align with the perspective of Kirk (2010), who argued that overcrowded and restrictive environments encourage traditional teaching methods and reduce student motivation.

The results also reveal that the current curriculum lacks clear instructional units related to exercise physiology and health education, which contributes to moderate or weak health awareness among students, especially regarding the risks of physical inactivity (mean = 2.81). These findings are consistent with the work of Green & Thurston (2002) in England, who reported a gap between official educational discourse and actual practice in physical education. Similarly, Haga et al. (2024) found limited perceived health competence among students in Norway. However, the main difference in the Algerian context is that the challenges are largely structural, such as lack of facilities and overcrowded classes (mean = 4.21). This supports the conclusion of Hardman (2008), who argued that limited resources in developing contexts often reduce the importance of physical education in schools. Overall, the findings suggest that students' limited health awareness is not mainly due to teachers' competence but rather to restrictive educational conditions. This conclusion is consistent with Sallis & McKenzie (1991), who emphasized that physical education can contribute to public health only when sufficient teaching time and resources are available.

Conclusion

In conclusion, the present study highlighted the potential of the secondary school physical education curriculum to support national health awareness and chronic disease prevention strategies in Algeria. The findings demonstrate a high level of professional readiness, solid academic qualifications, and strong motivation among physical education teachers to actively contribute to these health preventive goals.

Through this investigation, the researchers established that while teachers possess strong pedagogical readiness, the current school environment and the structure of the curriculum present valuable opportunities for ongoing logistical and conceptual optimization. To further maximize this pedagogical contribution, the study suggests that future educational planning could focus on enhancing the integration of explicit instructional units related to exercise physiology and preventive health within the official program. Additionally, providing further institutional support, such as expanding specialized training and continuously upgrading school sports facilities, would significantly enhance teachers' ability to balance standard curriculum requirements with preventive health objectives. Ultimately, these insights offer a collaborative perspective for educational authorities to continuously develop school infrastructure and curricula, ensuring that physical education serves as an effective, long-term strategic tool for youth health promotion.

Disclosure of interest

All authors declare no conflict of interest.

Received: 06 April 2026; **Accepted:** 22 June 2026; **Published:** 15 July 2026

References

Anderson, E., & Durstine, J. L. (2019). Physical activity, exercise, and chronic diseases: A brief review. *Sports medicine and health science*, *1*(1), 3–10. https://doi.org/10.1016/j.smhs.2019.08.006

Biddle, S. J., & Asare, M. (2011). Physical activity and mental health in children and adolescents: A review of reviews. British Journal of Sports Medicine, 45(11), 886-895

Chengyu, Z., Xueyan, H., & Ying, F. (2024). Research on disease management of chronic disease patients based on digital therapeutics: A scoping review. *Digital health*, *10*, 20552076241297064. https://doi.org/10.1177/20552076241297064

Green, Ken, Thurston, M. (2002). Physical education and health promotion: a qualitative study of teachers' perceptions. Health Education. https://doi.org/10.1108/09654280210426001

Haerens, L., Kirk, D., Cardon, G., & De Bourdeaudhuij, I. (2011). Toward the development of a pedagogical model for health-based physical education. Quest, 63(3), 321-338

Haga, M., Malmin, V., & Østerlie, O. (2024). Secondary school students' perception of health and teaching of health dimensions in physical education. *Physical Education and Sport Pedagogy*, 1–13. https://doi.org/10.1080/17408989.2024.2383195

Hardman, K. (2008). Physical education in schools: a global perspective. Kinesiology, 40(1), 5-28.

Hof-Nahor, I., & Biswas, S. (2020). Health Promotion in Israeli Colleges of Higher Education-The Example of Oranim College of Education. *Frontiers in public health*, *8*, 408. https://doi.org/10.3389/fpubh.2020.00408

Jiang, S., Zeng, N., Ng, J. Y. Y., Chong, K. H., Zeng, T., Leung, S. K. Y., & Ha, A. S. (2025). Effects of physical activity interventions on fundamental movement skills and cognitive function in early childhood: A systematic review and network meta-analysis. *Journal of sport and health science*, *15*, 101085. Advance online publication. https://doi.org/10.1016/j.jshs.2025.101085

Kirk, D. (2010). Physical Education Futures. Routledge.

Metzler, M. W. (2017). Instructional models for physical education. Routledge.

Ramires, V. V., Dos Santos, P. C., Barbosa Filho, V. C., Bandeira, A. D. S., Marinho Tenório, M. C., de Camargo, E. M., Ravagnani, F. C. P., Sandreschi, P., de Oliveira, V. J. M., Hallal, P. C., & Silva, K. S. (2023). Physical Education for Health Among School-Aged Children and Adolescents: A Scoping Review of Reviews. *Journal of physical activity & health*, *20*(7), 586–599. https://doi.org/10.1123/jpah.2022-0395

Sallis, J. F., McKenzie, T. L., Beets, M. W., Beighle, A., Erwin, H., & Lee, S. (2012). Physical education's role in public health: steps forward and backward over 20 years and HOPE for the future. Research quarterly for exercise and sport, 83(2), 125–135. https://doi.org/10.1080/02701367.2012.10599842

Viner, R., & Macfarlane, A. (2005). Health promotion. *BMJ (Clinical research ed.)*, *330*(7490), 527–529. https://doi.org/10.1136/bmj.330.7490.527

Warsy, A. S., & el-Hazmi, M. A. (1999). Diabetes mellitus, hypertension and obesity--common multifactorial disorders in Saudis. *Eastern Mediterranean health journal = La revue de sante de la Mediterranee orientale = al-Majallah al-sihhiyah li-sharq al-mutawassit*, *5*(6), 1236–1242.

Watson, K. B., Carlson, S. A., Loustalot, F., Town, M., Eke, P. I., Thomas, C. W., & Greenlund, K. J. (2022). Chronic Conditions Among Adults Aged 18–34 Years - United States, 2019. *MMWR. Morbidity and mortality weekly report*, *71*(30), 964–970. https://doi.org/10.15585/mmwr.mm7130a3

World Health Organization. (2020). *WHO guidelines on physical activity and sedentary behaviour*. World Health Organization. https://www.who.int/publications/i/item/9789240015128

World Health Organization. (2025). *Noncommunicable diseases*. https://www.who.int/news-room/fact-sheets/detail/noncommunicable-diseases

World Medical Association (2013). World Medical Association Declaration of Helsinki: ethical principles for medical research involving human subjects. *JAMA*, *310*(20), 2191–2194. https://doi.org/10.1001/jama.2013.281053

DOI 10.26773/jaspe.260704

Journal of Anthropology of Sport and Physical Education

REVIEW PAPER

Youth Sports, Civilizational Advancement, and Human Communication: Lessons from the Qatar 2022 FIFA World Cup

Mouloud Kenioua[1], Nawal Krine[2], Mohammed Meratate[3], Said Yahiaoui[4]

[1]Department of Physical Education, Institute of Sciences and Techniques of Physical and Sports Activities, University of Batna2, Batna, Algeria, [2]Department of Arabic Language,Faculty of Arts,University of Batna1, Batna, Algeria, [3,4]Department of Physical Education, Laboratory of Sciences and Technology of Educational Sport Activity, University of Batna2, Batna, Algeria

Abstract

This study examines the pivotal role of young athletes and youth stakeholders during the 2022 FIFA World Cup in Qatar in advancing civilizational development and fostering human communication. The tournament represented an unprecedented platform through which Arab and Islamic identity was projected to a global audience in a balanced and contemporary manner, supported by the active engagement of young volunteers, administrators, and community initiative leaders. The study adopts the Scoping Review methodology following PRISMA- ScR standards , drawing on literature published between 2022 and 2025 across international and Arab academic databases. A total of 53 studies were identified and analyzed, covering themes of youth empowerment, national identity, sports diplomacy, volunteering, and sustainable development. Results indicate that the Qatar 2022 World Cup constituted a turning point in the global perception of Arab youth, enabling genuine leadership roles in organization, intercultural communication, and cultural influence. The tournament served as a space for embodying Islamic and humanitarian values of hospitality and coexistence, strengthening national identity and social capital. Youth volunteering emerged as a foundational pillar of civic participation, while media and cultural programs contributed to dismantling stereotypes and reshaping international discourse about Arabs and Muslims. Qatar's national strategies, aligned with Qatar Vision 2030, ensured the sustainability of the tournament's impact through extended sports and developmental initiatives. The study concludes that major sporting events can function as effective instruments of civilizational advancement when guided by a youth-empowering perspective that integrates sports with social, cultural, and developmental values. Recommendations include sustained investment in youth capabilities through sports education, cultural diplomacy, and sustainable leadership programs.

Keywords: *sports youth; civilizational advancement; human communication; Qatar World Cup 2022; youth empowerment; cultural diplomacy*

Introduction

In recent decades, the intersection of sports, youth policy, and urban development has emerged as one of the most dynamic frontiers of international discourse. The unprecedented global interest in harnessing major sporting events as vehicles for social transformation has shifted the paradigm of how nations conceptualize and invest in their youth capital. No longer confined to athletic achievement, international tournaments - particularly the FIFA World Cup - have evolved into comprehensive civilizational platforms that carry profound implications for national identity, intercultural communication, and the repositioning of nations within the global order. This evolution is not incidental; it reflects

Correspondence:

Montenegro Sport

Mouloud Kenioua
Department of Physical Education, Institute of Sciences and Techniques of Physical and Sports Activities, University of Batna2, Batna, 05700, Algeria
E-mail: mouloud.kenioua@univ-batna2.dz

a deeper structural transformation in the values and priorities of the international community, one in which youth are no longer passive beneficiaries of development policies but are recognized as active architects of cultural change and human progress (Ulrichsen, 2023; FIFA, 2022; UNESCO, 2021).

Scholars and international institutions have increasingly acknowledged that major sporting events generate what may be termed a 'soft infrastructure' of human development - a web of skills, values, networks, and narratives that outlast the tournament itself. In this context, sports tournaments function as major platforms for embodying social transformations and fostering human bridges between nations, confirming that sport has become a fundamental catalyst for promoting dialogue, openness, and cultural tolerance at both the local and global levels (Ulrichsen, 2023 ; FIFA, 2022; UNESCO, 2021). The mechanisms through which this transformation occurs - volunteering, cultural programming, media engagement , digital activism, and youth leadership structures - constitute a rich field of inquiry that remains insufficiently theorized in the academic literature.

In light of these transformations, the 2022 FIFA World Cup in Qatar emerged as an exceptional and historically unprecedented model of the active role of youth in shaping the features of a modern civilizational renaissance. For the first time in the history of the World Cup, an Arab nation assumed the role of global host, transforming the event from a mere sporting competition into a carefully orchestrated encounter between civilizations. Qatar harnessed all its national capacities - as outlined in its Qatar National Vision 2030 and in alignment with the United Nations Sustainable Development Goals programs - to invest in the tournament as a civilizational sports event and a pivotal turning point in the image of Arab youth before the world. The Vision 2030 framework, grounded in four interlocking pillars of human, social, economic, and environmental development, provided a coherent strategic scaffolding within which th e World Cup was positioned not as an end in itself, but as a catalyst for long- term human capital formation (Kerry et al., 2024; Yaylali, 2025; Brannagan et al., 2023; Al Gheithi et al., 2024).

The manifestations of this strategy were visible across multiple dimensions of the event. Qatari and Arab youth participated extensively in leadership roles, organizational management, volunteering, and creative cultural expression, demonstrating a level of civic engagement and international readiness that challenged longstanding stereotypes about the Arab world's capacity for global event management. This active participation enhanced their presence in cultural dialogues, opened unprecedented avenues for human communication through social and digital initiatives, and contributed substantively to building a national identity and shared civilizational values at both local and international levels. The symbolic power of these youth-led contributions was amplified through digital platforms and global media coverage, which collectively reframed the narrative of Arab youth from one of marginalization to one of leadership and cultural pride (Kerry et al., 2024; Yaylali, 2025; Brannagan et al., 2023; Al Gheithi et al., 2024).

Despite the numerous partial studies that have examined the effects of the World Cup on various dimensions of Qatari and Arab society, there remains a significant gap in the literature: the absence of a comprehensive methodological framework that addresses the actual and structural contribution of young athletes to achieving civilizational advancement and activating human communication programs. This gap is particularly pronounced within the Arab context, which faces renewed and intensifying challenges in the domains of identity construction, international media representation, and the reclamation of cultural agency in global discourse. Most existing research has tended to concentrate on organizational efficiency , economic returns, infrastructure investment, and geopolitical soft power, without delving into the social and cultural depth of the event or systematically examining the qualitative impacts of youth leadership on community cohesion, intercultural dialogue, and identity formation (Ishac et al., 2024; Bouatelli, 2025; Bettine & Ozdemir, 2024).

This methodological lacuna is not merely an academic concern ; it has practical implications for policymakers, development organizations, and future host nations seeking to leverage sporting mega-events as instruments of human development. Traditional analytical frameworks have proven insufficient for capturing the multidimensional nature of youth contributions, which span the domains of sports management, community development, cultural diplomacy, digital communication, and civic leadership. The importance of addressing this gap is further amplified by the growing emphasis within international organizations and United Nations programs on youth empowerment as a core dimension of global development strategy, and by the explicit mandate - enshrined in multiple international frameworks - to maximize the civilizational outcomes of major sporting events (FIFA, 2023; United Nations, 2015; UNESCO, 2021). Closing this gap requires an integrative research approach that bridges the fields of sports science, cultural studies, youth policy, and international development, and that treats the 2022 World Cup as both a case study and a generative model for understanding the transformative potential of sport-based youth engagement.

In light of accelerating global demographic changes - in which youth now constitute the majority of the population in many developing nations - and the intensifying international competition for soft power, cultural influence, and developmental leadership , the Qatari experience emerges as a global source of inspiration and a model worthy of rigorous scholarly examination. Qatar succeeded in developing a socio-cultural sports model that integrates youth not merely as participants in a sporting spectacle, but as agents and leaders of civilizational change - influencers who operate simultaneously in the sports arena, in community development, in media production, and in local and international development programs (Sammour, 2023; Ekren, 2024; Parvez, 2024). This model challenges the conventional separation between sports and development, and demonstrates that when youth are granted genuine institutional agency within the framework of a major event, the outcomes extend far beyond the stadium.

The Qatari experience also carries significant implications for the ongoing global dialogue about the relationship between cultural authenticity and international integration. By asserting its Arab-Islamic identity while simultaneously embracing the universalism of the World Cup, Qatar offered a nuanced and provocative response to the often-binary framing of cultural difference in international discourse. The capacity of Qatari and Arab youth to navigate this complexity -to be simultaneously local and global, rooted and connected- offers a model of cultural leadership that transcends the specific context of the 2022 tournament and speaks to broader questions about the role of youth in shaping the cultural futures of their societies (Sammour, 2023; Ekren, 2024; Parvez, 2024).

In addressing these issues, this extensive systematic review aims to produce a comprehensive and evidence-based mapping of the roles played by young athletes and youth stakeholders during the Qatar 2022 World Cup in achieving urban and civilizational development goals and in enhancing human communication values, within the framework of national and international programs. The review examines and critically synthesizes recent empirical studies, international policy documents, institutional reports, and local grassroots initiatives that collectively shaped this role. It further seeks to identify the key indicators of change

in identity formation, youth leadership, cultural dialogue, and the transmission of human values that stemmed from this singular event, with the aim of constructing a replicable analytical framework applicable to future sporting mega-events.

The study is guided by the following primary research question (PRQ):

- How did youth in sports contribute to civilizational advancement and the enhancement of human communication during the Qatar 2022 World Cup, and how did the event's outcomes reflect on the image of Arab youth on the international stage?

This primary question is operationalized through three secondary research questions (SRQs):

- SRQ1: What programs and institutional strategies - at the national and international levels - shaped the role of Arab youth during the Qatar 2022 World Cup?
- SRQ2: What are the measurable indicators of change in youth identity, leadership capacity, and cultural dialogue that emerged from the event?
- SRQ3: How can the Qatari model be theorized as a transferable framework for youth-led civilizational development in the context of future sporting mega-events?

Methods

PRISMA-ScR Framework

PRISMA-ScR (Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews) provided a rigorous and transparent methodology for compiling and analyzing the literature related to the role of youth and sports in urban development. PRISMA-ScR emphasizes documenting the research steps from formulating the review question, identifying databases, and inclusion and exclusion criteria, through the multi-stage screening phase , and then systematically analyzing the data and extracting results (Tricco et al., 2018).

Databases and Research Platforms

Databases and Research Platforms The scoping review relied primarily on international and local electronic databases known for their comprehensive coverage of multidisciplinary studies in sports science, sociology, and development. The systematic search was conducted by the first author (M. Kenioua) across the following databases: Scopus, Web of Science (WoS), SPORTDiscus (EBSCO), Google Scholar, and ScienceDirect for international sources. National, Arab, and regional platforms such as 'Dar Almandumah' for Arab databases, 'Qatar Digital Library,' and 'Rifad' were consulted as essential references for monitoring academic research output in the Arab world. In accordance with methodological literature (Tricco et al., 2018; Peters et al., 2020), the search diversified between major multidisciplinary databases, subject-specific databases, and gray literature sources to ensure comprehensiveness, avoid publication bias, and enhance the reliability and scientific value of the scoping review.

Search Strategy and Criteria

To ensure comprehensiveness and more accurate retrieval of the relevant literature, this strategy included the use of a mix of primary and semantic keywords in both Arabic and English, along with the adoption of Boolean Operators (AND, OR, NOT) to synthesize and refine the results precisely according to the review question and the volume of available literature. Keywords used in English: youth, youth empowerment, FIFA World Cup Qatar 2022, social development, civic engagement, sports and development, volunteering, national identity, soft power, cultural dialog. Inclusion Criteria: (1) The study should address youth issues, development, or social change within the context of the 2022 Qatar World Cup; (2) Focus on the social and cultural impacts of the event; (3) The scientific material should be a peer-reviewed article, academic study, original research report, reliable field study, or official report from government agencies or official organizations; (4) Publication within the period 2022–2025; (5) Published in Arabic or English. Exclusion Criteria: (1) Studies with a purely technical nature not related to social or developmental dimensions; (2) Studies that lack scientific quality or academic standards; (3) Repetitions or non-scientific deliberations such as newspaper articles or undocumented opinions.

Screening and Review Stages

The stages of sorting and auditing were carried out in a manner that combines technology and meticulous manual review. The first author (M.K.) relied on Excel to organize study data, monitor the initial sorting process, and remove duplicates. A thorough manual review was then conducted by a team of six specialized reviewers: two experts in Sport Sociology (University of Batna 2 and University of Ouargla), two experts in Sport Psychology (University of Algiers 3 and University of Batna 2), one expert in Intercultural Studies (University of Ouargla), and one expert in Cultural Dialogue (University of Ouargla) — all holding the rank of Professor, which included examining study abstracts and selecting preliminary research based on their compliance with the specified inclusion and exclusion criteria.

This was followed by a careful reading of the full texts of the studies that passed the screening, to ensure they met all methodological criteria. Consensus sessions were held among the reviewers to resolve any discrepancies or disagreements in assessing the studies' suitability, in accordance with the methodological literature recommendations for scoping reviews (Peters et al., 2020; Tricco et al., 2018)

Data Extraction and Tabulation

A precise and multi-level approach was adopted in data extraction and tabulation in line with the review's axes and analytical objectives. Data extraction was performed independently by the first author (M.K.) and verified by the second author (N.K.) to ensure accuracy and consistency. In the first phase, main tables were prepared that included the most prominent variables such as the researcher's name/publishing entity, the year of the study, the title, the abstract, the type of methodology used (qualitative, quantitative, mixed, report, case study), the main results or the civilizational and communicative indicator, in addition to the specialization or field axis.

Independent tables were allocated for some complex axes, such as the table of targeted age groups, which enabled the identification of recurring patterns in age approaches within the studies. Additionally, a special table was created to distribute the studies according to the main axis (youth empowerment, national/cultural identity, civilizational dialog, volunteering, development, sports diplomacy, human rights, and religious values), detailing the number of studies, geographical distribution, time frame, and the prevailing methodological approach for each axis (Levac et al., 2010; Peters et al., 2020).

Results

After completing the research process and collecting relevant studies, screening and evaluation criteria were applied according to the PRISMA methodology to identify the studies that address the research problem related to the role of the 2022 Qatar World Cup in promoting youth empowerment, civil dialog, and social values. This process yielded a diverse set of studies in terms of their methodologies, approaches, and theoretical frameworks. Figure 1 shows the PRISMA flow diagram that illustrates the stag-

es of the scientific evidence selection process, starting from the identification of sources, then exclusion based on specific criteria, leading to the final studies included in the review (317 records identified → 167 duplicates removed → 150 titles screened → 97 excluded → 53 full-text studies included). Table 1 provides a comprehensive analytical summary of the listed studies, including the title of each study, the year of publication, the research methodology, and the main indicator or result related to civilizational dialog, youth empowerment, or social development. Table 2 illustrates the distribution of these studies according to major thematic axes such as youth empowerment, cultural identity, civilizational dialog, volunteering, sustainable development, sports diplomacy, and human rights, providing an overview of the methodological, temporal, and geographical diversity of these studies. Table 3 presents the distribution of age groups covered by the studies; the youth group (18–35 years) was the most frequently addressed, as it is the pivotal group in community participation and shaping the legacy of the World Cup.

Table 1. Full Summary of Studies on FIFA World Cup Qatar 2022

No.	Author(s)	Year	Study Title	Full Summary	Methodology	Key Findings / Cultural or Communication Indicator
1	Sammour, K.	2023	Qatar 2022 World Cup Cultural Celebration: An Arabic Model of Cultural Diplomacy	The study reviews how Qatar transformed the FIFA World Cup 2022 into a model of cultural diplomacy and enhanced the presence of Arab youth through cultural celebration and global interaction.	Qualitative / Analytical	Promoting cultural dialogue and youth engagement
2	Ishac, W., & Swart, K.	2022	Social impact projections for Qatar youth residents from 2022	The study analyzes the social impact of the World Cup on Qatari youth, focusing on strengthening values and cultural belonging.	Quantitative / Analytical	Enhancing values and cultural identity
3	Al-Thani, M.	2025	In the liminal realm: Qatar's world cup struggle between tradition, modernity, and human rights	The study discusses challenges between tradition and modernity and addresses human rights issues during the World Cup.	Qualitative	Balancing modernity, tradition, and human rights
4	Al-Emadi, A. et al.	2022	The Perceived Impacts of Staging the 2022 FIFA World Cup	The study examines community perceptions of the event's effects on youth identity and development.	Quantitative	Enhancing youth participation
5	Mohamadi Turkmani, E. et al.	2024	Social capital building through mega-sporting events	The study examines the creation of social capital among youth and society after the event.	Quantitative / Analytical	Strengthening social cohesion
6	Hartmann, D., Manning, A., & Green, K.	2023	Postgame Analysis: Qatar 2022 and the Social Significance of Global Sport	The study analyzes the event as a platform for civil dialogue, tolerance, and positive youth representation.	Qualitative / Analytical	Building positive youth image
7	Carvache-Franco, M. et al.	2024	Motivations and satisfaction of sports tourists during the World Cup	The study measures motivations and psychological and social impacts on visiting youth.	Quantitative / Descriptive	Satisfaction and well-being
8	Kerry, L. et al.	2024	Branding countries through multicultural events	The study analyzes the effect on Qatar's global image and communication.	Quantitative / Analytical	Nation branding
9	Zhang, C.	2024	Impact of the 2022 FIFA World Cup on Qatar	A comprehensive evaluation of economic, social, and diplomatic impacts.	Descriptive / Content Analysis	Multi-dimensional impact
10	Kozhanov, N. et al.	2024	The 2022 FIFA World Cup in Qatar: Global and Local Perspectives	Examines cultural identity and intercultural dialogue.	Analytical	Cultural dialogue
11	Brannagan, P. et al.	2023	Mass social change and identity hybridization	Analyzes social identity transformation and youth integration.	Qualitative / Analytical	Youth integration
12	Bettine, M., & Ozdemir, M.	2024	Soft power and sports diplomacy	Examines Western media framing and soft power.	Analytical / Cultural	Soft power

(continued on next page)

(continued from previous page)

Table 1. Full Summary of Studies on FIFA World Cup Qatar 2022

No.	Author(s)	Year	Study Title	Full Summary	Methodology	Key Findings / Cultural or Communication Indicator
13	FIFA	2022	Intercultural guidance	Reports on intercultural exchange programs during the event.	Policy Report	Cultural communication
14	Al-Emadi, A. A. et al.	2024	Resident interests and attitudes	Analyzes youth attitudes toward participation.	Sociological / Analytical	Social participation
15	Ishac, W.	2024	Social sustainability: Qatar youth perceptions	Examines youth views on sustainability and dialogue.	Field / Qualitative	Sustainability dialogue
16	Al-Hiti, N.	2023	Sports diplomacy and dialogue	Explores sports diplomacy in promoting tolerance.	Analytical / Descriptive	Dialogue and tolerance
17	Arab Democratic Center	2023	Arab soft power shaping global future perspectives	Examines the Arab soft power dimension of the World Cup.	Qualitative / Analytical	Soft power
18	Al-Marri	2023	Sustaining youth motivation	Examines youth empowerment through global sports events.	Mixed	Youth empowerment
19	Zhao, Y., & Liu	2024	Impact of the World Cup on youth	Discusses social and professional development.	Descriptive / Qualitative	Knowledge integration
20	Luo et AL.	2022	Protests and calls for boycotting the Qatar World Cup 2022 spark online discussion and action away from the soccer pitch	Examines youth activism and social dialogue.	Qualitative / Field	Human rights dialogue
21	Hidaya, M.	2024	Sport and sustainable development	Explores role of sport in sustainable development.	Policy Analysis	Sustainability
22	FIFA	2022	Social impact report	Highlights global social impact on youth.	Report	Social impact
23	Elbanna.et al.	2025	The FIFA World Cup Qatar 2022: Unveiling Insights Beyond the Pitch	Documents cultural diversity and youth engagement.	Case Study / Analytical	Youth engagement
24	Ulrichsen, K. C	2023	Nation branding and soft power	Examines Qatar's global image.	Analytical	National branding
25	Qatar Foundation	2023	Social change programs	Describes youth-led social initiatives.	Descriptive	Social change
26	Brannagan & Reiche	2023	Nation branding analysis	Analyzes positive global perception.	Content Analysis	Positive image
27	Jarvie & Yujun	2022	Social values post-event	Discusses post-event societal values.	Qualitative	Social values
28	Al-Ghanim	2023	Survey on perceptions	Measures citizens' attitudes.	Survey	Social perception
29	Munzilin	2024	Post-COVID cultural branding	Promotes cultural understanding globally.	Case Study	Cultural diplomacy
30	Rizana & Lisnarini	2023	Brand ambassador analysis	Examines inclusive engagement.	Qualitative	Inclusion
31	Diop et al.	2022	Volunteering interest	Measures youth volunteering interest.	Survey	Participation
32	Hajjaj et al.	2024	World Cup legacy	Examines identity and development legacy.	Analytical	Social cohesion
33	FIFA	2023	Volunteer capacity building programme	Highlights skill development programs.	Report	Teamwork
34	El-Kassem et al.	2024	Barriers to volunteering	Analyzes social and economic barriers.	Survey	Participation constraints
35	Bouatelli	2025	Digital transformation	Examines digital empowerment of youth.	Comparative Study	Digital participation

(continued on next page)

(continued from previous page)

Table 1. Full Summary of Studies on FIFA World Cup Qatar 2022

No.	Author(s)	Year	Study Title	Full Summary	Methodology	Key Findings / Cultural or Communication Indicator
36	Yaylali	2025	National identity	Examines pride and solidarity.	Analytical	National identity
37	Amara & Bouandel	2024	Infrastructure and development	Discusses national development impact.	Analytical	Economic development
38	FIFA	2022	Youth empowerment report	Highlights educational programs.	Policy Report	Youth capacity
39	Solimane & Elfekair	2024	Tourism impact	Examines youth travel intentions.	Field Study	Cultural openness
40	Parvez	2024	Women participation	Examines empowerment of young women.	Qualitative	Female leadership
41	Al-Mulla	2024	Sustainability achievements	Examines environmental sustainability.	Content Analysis	Sustainability
42	Al Gheith et al.	2024	Social impact survey	Measures happiness and cohesion.	Survey	Social cohesion
43	Al-Malik	2025	Human rights protection	Examines legal frameworks.	Legal Analysis	Rights awareness
44	Al-Azmi	2023	Social communication and Islamic values	Examines Islamic values and youth participation.	Qualitative	Religious values
45	Mohamed, M.	2023	Arab media coverage	Examines Arab identity in media.	Content Analysis	Arab identity
46	Fouda, M. et al.	2024	Foreign media image	Examines representation of Arabs.	Media Study	Positive image
47	Al-Bouhaliqa	2025	Sports diplomacy	Examines changing stereotypes.	Analytical	Soft power
48	Mostafa, A.	2023	Islamic outreach during World Cup	Examines religious communication strategies.	Anthropological	Cultural interaction
49	Ishac et al.	2024	Sentiment analysis of tweets	Examines public mood via social media.	Data Analysis	Public sentiment
50	Al Halk	2023	Football participation legacy	Examines youth participation in football.	Field Study	Sport development
51	Al Fahadi	2022	Nation branding tool	Examines digital branding strategies.	Analytical	Global image
52	Ayouni	2022	Volunteer hosting program	Examines hospitality and cooperation.	Field Study	Social cooperation
53	Ekren	2024	Islamic values and sustainability	Examines theoretical framework linking Islam and sustainability.	Analytical / Theoretical	Sustainable values

Figure 1. PRISMA Flow Diagram — Study Selection Process

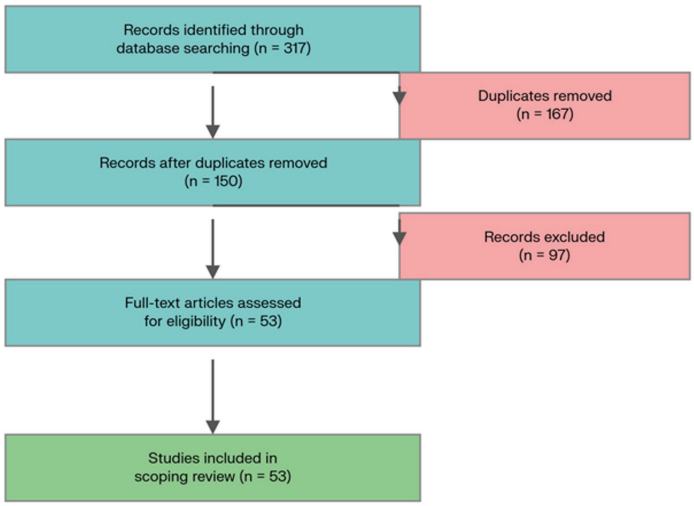


FIGURE 1. PRISMA flow diagram illustrating the study selection process.

Table 2. Distribution of Studies by Main Axis, Temporal, and Methodological Analysis

Main Axis	Studies (n)	Geographical Distribution	Time Frame	Methodology
Youth Empowerment	14	Qatar & Gulf, Arab and Western countries	2022–2025	Qualitative, Quantitative, Policy Reports
National / Cultural Identity	13	Qatar, Gulf, Arab & international contexts	2022–2025	Analytical, Field Studies, Media Analysis
Cultural Dialogue & Communication	9	Qatar, Gulf, international organizations	2022–2024	Qualitative, Cultural Analysis, Policy Studies
Volunteering & Community Participation	8	Qatar, Gulf, Arab & international volunteers	2022–2024	Quantitative, Qualitative, Program Analysis
Development (Social / Sustainable)	15	Qatar, Arab world, global comparisons	2022–2025	Quantitative, Descriptive, Policy Reports
Sports Diplomacy	10	Qatar, Gulf, global media coverage	2022–2025	Analytical, Qualitative, Media Studies
Human Rights	6	Qatar, international organizations	2022–2025	Legal, Descriptive, Comparative
Religious & Islamic Values	3	Qatar, transregional Islamic perspective	2023–2024	Qualitative, Anthropological, Theoretical

Table 3. Distribution of Age Groups Addressed in the Studies

Age Group	Number of Studies	Main Focus
Youth (18–35 years)	36	Main target group; focus on empowerment, participation, volunteering, and social development
Adolescents (<18 years)	9	School participation, value formation, and belonging through sports
Young Women / Girls	7	Focus on empowerment, leadership, and sports participation
Adults (>35 years)	6	Often comparative samples; focus on societal attitudes and advisory roles
Mixed / General Population	12	Multi-age samples or general societal analysis

Quantitative Analysis of Research Topics

The statistical tables indicate that most of the research literature between 2022 and 2025 focused on issues of community development (15 studies), followed by youth empowerment (14), and national and cultural identity (13). Through the study by Hidaya (2024), which highlighted how sports investment and the impact of the World Cup promoted sustainable development in Qatari society, the deep interest in the structural transformations accompanying the event is evident. In the same context, Ulrichsen (2023) provides an analysis of the soft power that Qatar gained through the championship, documenting how national development projects integrated with the country's global image. Regarding youth empowerment, Al-Marri's (2023) study analyzed the impact of major sporting events on shaping new leadership roles for Arab youth in volunteering and innovation. The study by Al-Emadi et al. (2022) directly addressed the effects of the World Cup on enhancing participation and self-awareness among young groups. As for the identity axis, Brannagan et al. (2023) explained how the championship contributed to restructuring Qatari belonging and enhancing Arab pride through international media coverage. Additionally, Yaylali (2025) made the World Cup event a platform to celebrate national uniqueness and enhance social solidarity in the era of globalization.

Sports diplomacy was a notable focus; Bettine & Ozdemir (2024) emphasized Qatar's use of the tournament to craft a new soft power, which helped correct stereotypes and present a global model for peaceful dialog and cultural coexistence. Regarding civilizational dialog, Sammour (2023) demonstrated how the tournament created a model for cultural rapprochement and effective channels for civilizational communication through youth.

Methodological Intertwining in Research Tools

The systematic analysis reveals that the research on the 2022 Qatar World Cup was characterized by clear diversity in research tools and methods. The quantitative approach was used in approximately 22 out of 53 studies, reflecting the strength of field surveys, questionnaires, and digital data analysis in measuring social impacts. For example, the study by Al-Emadi et al. (2022) used surveys and digital data analysis to monitor community perceptions of the event, providing accurate quantitative data on the tournament's impact on development and youth identity. In the same context, the study by Diop et al. (2022) used questionnaire tools and quantitative surveys to measure the motivations for voluntary work among Qatari youth. Digital data analysis tools for big data also emerged in the study by Ishac et al. (2024), which relied on analyzing Arabic Twitter data to monitor public sentiments during the World Cup events. Conversely, 17 studies relied on the qualitative approach, which dominated the discussion of identity issues, civilizational communication, and cultural and media studies. This approach has emerged in studies such as Brannagan et al. (2023) and Yaylali (2025), which relied on qualitative analysis of journalistic narratives and media discourse content. Mixed-method studies that combined both quantitative and qualitative approaches numbered approximately 14, evident in the research of Hartmann et al. (2023) and Kerry et al. (2024).

Temporal Trends in Research Production

The results of the study distribution indicate that the research output on the Qatar 2022 World Cup is concentrated in three main temporal waves. Initially, the period before and during the event (2022) witnessed a surge in studies addressing themes of

identity, international image, and societal expectations. With the transition to the post-tournament period (2023), analytical studies emerged addressing the sustainable legacy of the event, shifting from measuring immediate reactions to evaluating the social, economic, and administrative changes that began to take root in Qatari and Gulf society. In the more recent years (2024–2025), studies have increasingly focused on measuring long-term impact, youth empowerment programs, and developing volunteer policies, in addition to leveraging digital indicators and qualitative narratives to enhance the understanding of societal transformations.

Distribution of Age Groups

The distributional analysis of the targeted age groups reveals a clear dominance of the youth category (18– 35 years). Most studies — such as Al-Emadi et al. (2022) on the perceptions of Qatari youth toward the tournament and Al-Marri (2023) on youth empowerment through major sporting events — confirmed this category as the main drive r in the context of sports and social legacy. Some studies focused on adolescents and school students, such as Qatar Foundation (2023), which examined the impact of school and volunteer programs on building values and belonging among the rising generation. The focus on girls and young women has also emerged in recent years; Parvez (2024) addressed the empowerment of young Qatari women and the challenges they faced in sports participation and gender equality policies in the context of the championship.

Discussion

Interpretation of the Results According to the Theoretical Framework

The results of this review reveal a significant alignment between the empirical evidence and the theoretical framework, which considers young athletes a driving force for civilizational advancement and the enhancement of global communication. Most studies, such as those by Al-Emadi et al. (2022), have shown that Qatari and Arab youth were at the forefront of societal forces driving the path of cultural and social development, benefiting from the World Cup experience to practice leadership, enhance national belonging, and embody the values of dialog and tolerance in a multinational and multicultural environment. These findings are consistent with earlier scholarship on mega-events and social transformation; for instance, Coalter (2007) and Giulianotti et al. (2016) argued that large-scale sporting events serve as catalysts for civic identity formation and intercultural exchange - a proposition that the Qatar 2022 case strongly corroborates and extends into the Arab context.

The civilizational contribution of youth lies in their ability to transform the sporting event into a platform for exchanging experiences and establishing cross-border communication networks. Qualitative studies (Brannagan et al., 2023; Sammour, 2023) have documented how young people dedicated digital communication tools, volunteer work, and community initiatives to establish a positive image of the Arab state and to reshape the narrative of identity and belonging in global circles. This aligns with findings by Giulianotti & Robertson (2009), who demonstrated that global sporting events generate what they termed "glocal" identities -simultaneously local and universal - a dynamic that was particularly pronounced in Qatar's deliberate projection of Arab-Islamic values alongside universal hospitality norms. Compared to previous World Cup host nations such as South Africa (2010) and Brazil (2014), where youth engagement was largely organic and unstructured, Qatar's institutionalized approach through programs such as Generation Amazing and the Qatar Volunteers program represents a qualitative advancement in harnessing youth agency for deliberate civilizational messaging (Kerry et al., 2024; Ulrichsen, 2023).

According to contemporary theoretical perspectives in the sociology of sport and development, the rise of youth in the field of leadership and influence reflects a strategic transformation crucial for the advancement of societies and the construction of resilient civilizational images capable of meeting the demands of sustainable development (Diop et al., 2022; Al-Marri, 2023). This finding resonates with Hartmann & Kwauk's (2011) theoretical model of "sport for development," which posits that youth participation in organized sporting contexts can generate transformative social capital - though the Qatar case extends this model by demonstrating that such capital can operate at a civilizational, rather than merely community, scale.

Research Gaps and Future Needs

Despite the extensive body of studies on the Qatar 2022 World Cup, the review reveals clear research gaps that still need to be addressed more deeply in future literature. One of the most prominent gaps is the relatively weak attention to human rights issues and religious and social values, despite the intense international media presence on these topics. This stands in notable contrast to existing literature on previous mega-events, where human rights dimensions - particularly those concerning labor rights and displacement - received substantial scholarly attention (Grix & Houlihan, 2014; Zimbalist, 2015). The comparative absence of rigorous human rights analysis in the Qatar 2022 literature suggests either a disciplinary avoidance of politically sensitive dimensions or a methodological limitation in accessing marginalized voices.

At the methodological level, one of the prominent weaknesses lies in the limited samples of some studies or their restriction to a single category or geographical area without generalizing the results or testing them across diverse contexts (Al-Emadi et al., 2022; Diop et al., 2022). Some studies often lacked cross-analysis between the categories or variables used within the samples, which limited the studies' ability to reveal complex societal dynamics. These methodological shortcomings echo concerns raised by Coalter (2010) regarding the "problem of attribution" in sport-for-development research - namely, the difficulty of isolating the specific effects of a sporting event from broader social, political, and economic processes occurring simultaneously. The weaknesses remained in the lack of longitudinal studies that measure the impact over the years, and the insufficient focus on marginalized groups such as migrant workers, people with disabilities, or the elderly (Ulrichsen, 2023) -groups whose experiences of the World Cup diverged substantially from those of the youth cohorts that dominate the existing literature.

Practical Implications

The results of the review form a clear knowledge base that can be practically employed to enhance national sports policies and youth empowerment programs in Qatar and the Arab world. Studies have highlighted the pivotal role of youth in driving civilizational change, which necessitates the redesign of sports development policies to focus not only on competition or achievements but also on building leadership capacities and community initiatives, and localizing volunteerism within a comprehensive future vision (Al-Emadi et al., 2022; Al-Marri, 2023). These recommendations are consistent with the UNESCO (2021) framework on sport and sustainable development, which explicitly calls for embedding youth leadership within the organizational architecture of major sporting events rather than treating it as a supplementary activity.

In light of these results, sports institutions can leverage major events such as the World Cup to launch quality programs that

focus on the professional and social empowerment of youth, and to enhance partnerships between government entities, the private sector, and civil society to build an environment supportive of youth leadership in sports and volunteer work. This multi-stakeholder approach mirrors successful models documented in the context of the London 2012 Olympic Games (Girginov & Hills, 2008), where structured public-private collaboration produced measurable improvements in youth civic engagement and community cohesion. The review also highlights the importance of directing efforts toward empowering women and underrepresented groups to ensure the inclusivity of social development, which aligns with the United Nations Sustainable Development Goals 2030 related to gender equality (United Nations, 2015).

From the perspective of human communication strategies, studies have shown that global sporting events represent a unique platform for instilling the values of civilized dialog and enhancing the international image of the host country. With the effective use of digital media and social media (Ishac et al., 2024; Kerry et al., 2024), communication policies can be developed that enable the construction of a modern, open national image capable of addressing different cultures and activating the role of sports in fostering human convergence and global recognition. This finding is particularly relevant in the post-COVID-19 era, during which digital platforms emerged as primary vehicles for cultural diplomacy, as documented by Parvez (2024) and Ekren (2024) in the context of Qatar's strategic media management during the tournament.

Conclusion

This scoping review demonstrates that the Qatar 2022 World Cup constituted a pivotal platform for civilizational and social transformation through the empowerment of Arab youth and the enhancement of their leadership and community roles. The literature review, employing a precise methodology that combines quantitative and qualitative analysis and the use of specialized extraction tables, highlighted the themes of youth empowerment, national identity, and civilizational dialog in the field of modern studies, with a strong presence of the roles of women and vulnerable groups. The results indicate that young athletes have effectively contributed to leading voluntary and organizational initiatives, and establishing values of openness and human dialog through programs such as 'Generation Amazing,' youth leadership workshops, and cultural and social exchange initiatives. These efforts have positively reflected in establishing the image of Arab youth as a symbol of ambition and building cultural bridges on the international stage. There is a need to develop applied and long-term studies on the impact of sports policies and programs on youth, with a focus on underrepresented groups, and to develop qualitative and quantitative measurement tools to assess community and leadership participation. This review lays a scientific foundation for formulating policies that support Arab youth, helping to achieve national and international development goals, and enhancing their positive presence in a rapidly transforming world that believes in sports as a means of human communication and comprehensive civilizational advancement.

Conflict of Interest
The authors declare no conflict of interest.

Received: 22 May 2026; **Accepted:** 26 June 2026; **Published:** 15 July 2026

References

Al Gheithi, R., Al Droushi, A. R., & Gafaar, A. (2024). Social impacts of hosting the 2022 FIFA World Cup on citizens and residents in Qatar. *Journal of Physical Education, 36*(1), 71–113. http://search.mandumah.com/Record/1498404

Alazmi, N. G. (2023). The role of Qatar 2022 World Cup in social development and communication between Gulf and Arab nations. *Arab Journal of Scientific Publishing, 59*, 137–161. http://search.mandumah.com/Record/1436611

Albouhliqa, H. A. (2025). World Cup in Qatar: Soft sports diplomacy that shocked everyone. *Arab Journal of Scientific Publishing, 78*, 23–42. http://search.mandumah.com/Record/1568663

Al-Emadi, A., Sellami, A. L., & Fadlalla, A. M. (2022). The perceived impacts of staging the 2022 FIFA World Cup in Qatar. *Journal of Sport & Tourism, 26*(1), 1–20. https://doi.org/10.1080/14775085.2021.2017327

Al-Emadi, A. A., Sellami, A. L., Al-Marri, S. S., El Madad, J. M. N., Alazaizeh, M. A. H., Fadlalla, A. M., & Almekaimi, H. Z. (2024). The 2022 FIFA World Cup in Qatar: Resident interests and attitudes. *Managing Sport and Leisure*, 1–18. https://doi.org/10.1080/14660970.2024.2384907

Alheiti, N. A. (2023). Sports diplomacy: Qatar 2022 World Cup as a model. *Journal of Alliance of Civilizations, 3*, 16–29.

Al-Marri, S. H. (2023). How to sustain motivation among the youth in Qatar beyond hosting the FIFA World Cup 2022? *QScience Connect (Special Issue–Thesis), 2023*(1), 1. https://doi.org/10.5339/connect.2023.spt.1

Al-Thani, M. (2025). In the liminal realm: Qatar's World Cup struggle between tradition, modernity, and human rights. *Frontiers in Sports and Active Living, 6*, Article 1434522. https://doi.org/10.3389/fspor.2024.1434522

Amara, M., & Bouandel, Y. (2024). Why Qatar's hosting of the 2022 FIFA World Cup matters. In *Research Handbook on Major Sporting Events* (pp. 271–284). Edward Elgar Publishing.

Arab Democratic Center for Strategic, Political, and Economic Studies. (2023). *Qatar World Cup 2022: Arab soft power shaping global future perspectives: Foresight visions – Part One.* Arab Democratic Center.

Ayouni, M. A. (2022). *Developing a host volunteer program for 2022 FIFA World Cup: Challenges and opportunities* (Thesis). Manara – Qatar Research Repository. https://doi.org/10.57945/manara.hbku.28032938.v1

Bettine, M., & Ozdemir, M. (2024). The men's World Cup in Qatar 2022 through the lens of the Western media: Soft power, sports diplomacy and sportswashing. *Sociology International Journal, 8*(4), 190–196. https://doi.org/10.15406/sij.2024.08.00394

Bouatelli, M. (2025). Arab experiences in the field of implementing digital management: A reading of the Qatari experience through Qatar E-Government 'HUKOOMI'. *Journal of Economic Growth and Entrepreneurship, 8*(1), 10–19. https://asjp.cerist.dz/en/downArticle/612/8/1/267007

Brannagan, P. M., & Reiche, D. (2022). The politics and power of small states: The 2022 World Cup and Qatar's global sports strategy. In *Qatar and the 2022 FIFA World Cup: Politics, controversy, change* (pp. 47–83). Springer International Publishing.

Brannagan, P. M., Reiche, D., & Bedwell, L. (2023). Mass social change and identity hybridization: The case of Qatar and the 2022 FIFA World Cup. *Identities: Global Studies in Culture and Power, 30*(6), 900–918. https://doi.org/10.1080/1070289X.2023.2203576

Carvache-Franco, M., Hassan, T., Orden-Mejía, M., Carvache-Franco, O., & Carvache-Franco, W. (2024). Motivations and satisfaction of sports tourists during the FIFA World Cup in Qatar 2022. *Heliyon, 10*(5), Article e26682. https://doi.org/10.1016/j.heliyon.2024.e26682

Coalter, F. (2007). *A wider social role for sport: Who's keeping the score?* Routledge. https://doi.org/10.4324/9780203014615

Coalter, F. (2010). The politics of sport-for-development: Limited focus programmes and broad gauge problems? *International Review for the Sociology of Sport, 45*(3), 295–314. https://doi.org/10.1177/1012690210366791

Diop, A., Jatić, Š., Holmes, J. L., Le Trung, K., El Maghraby, E., & Al Naimi, M. (2022). Interest in volunteering for the FIFA 2022 World Cup in Qatar: A nationally representative study of motivations. *Journal of Policy Research in Tourism, Leisure and Events.* https://doi.org/10.1080/19407963.2022.2125521

Ekren, D. C. (2024). *Islamic values, sustainability, and mega-event legacies: A case study from FIFA World Cup Qatar 2022* (Thesis). Manara – Qatar Research Repository. https://doi.org/10.57945/manara.hbku.29325545.v1

Elbanna, S., Elsharnouby, T., Aljafari, A., & Fatima, T. (2025). *The FIFA World Cup Qatar 2022: Unveiling insights beyond the pitch.* Springer Nature.

El-Kassem, R. C., Ahmed Lari, N., Al Maadeed, A., & Awadalla Mohamed Ali, A. (2024). Barriers to formal volunteering among married Qatari youth. *Cogent Social Sciences, 10*(1). https://doi.org/10.1080/23311886.2024.2386048

Fédération Internationale de Football Association (FIFA). (2022a). *Intercultural guidance.* FIFA Publications. https://publications.fifa.com/en/final-sustainability-report/social-pillar/cultural-understanding/intercultural-guidance/

FIFA. (2022b). *Social impact of the FIFA World Cup Qatar 2022.* FIFA Publications. https://publications.fifa.com/en/annual-report-2022/

FIFA. (2022c). *Youth education and empowerment overview.* FIFA

Final Sustainability Report. https://publications.fifa.com/en/final-sustainability-report/human-pillar/youth-education-and-empowerment/

FIFA. (2023). *Volunteer capacity building programme: FIFA World Cup Qatar 2022 sustainability report*. https://inside.fifa.com/tournament-organisation/world-cup-2022-sustainability-report/

Fouda, M. S. M., & Abdeldaim, A. A. A. (2024). The impacts of World Cup 2022 news on the image of Arabs and Muslims in foreign press. *Journal of Media Research and Studies, 27*, 179–280. http://search.mandumah.com/Record/1506647

Girginov, V., & Hills, L. (2008). A sustainable sports legacy: Creating a link between the London Olympics and sports participation. *The International Journal of the History of Sport, 25*(14), 2091–2116. https://doi.org/10.1080/09523360802439015

Giulianotti, R., Hognestad, H., & Spaaij, R. (2016). Sport for development and peace: Power, politics, and patronage. *Journal of Global Sport Management, 1*(3–4), 129–141. https://doi.org/10.1080/24704067.2016.1231926

Giulianotti, R., & Robertson, R. (2009). *Globalization and football.* SAGE Publications. https://doi.org/10.4135/9781446213544

Grix, J., & Houlihan, B. (2014). Sports mega-events as part of a nation's soft power strategy: The cases of Germany (2006) and the UK (2012). *The British Journal of Politics and International Relations, 16*(4), 572–596. https://doi.org/10.1111/1467-856X.12017

Hajjaj, M., Borodin, V., Perțicas, D. C., & Florea, A. G. (2024). Qatar's FIFA World Cup odyssey: A quest for legacy transforming a small nation into a global destination. *Heliyon, 10*(9). https://doi.org/10.1016/j.heliyon.2024.e30282

Hartmann, D., & Kwauk, C. (2011). Sport and development: An overview, critique, and reconstruction. *Journal of Sport and Social Issues, 35*(3), 284–305. https://doi.org/10.1177/0193723511416986

Hartmann, D., Manning, A., & Green, K. (2023). Postgame analysis: Qatar 2022 and the social significance of global sport. *Contexts, 22*(3), 62–64. https://doi.org/10.1177/15365042231192501

Hidaya, M. (2024). Investing in sports to promote sustainable development goals: The case of the Qatari humanitarian and developmental sector after the World Cup. *Hokama Journal, 8*, 156–183. https://doi.org/10.31430/WVEB9922

Ishac, W. (2024). Examining sport tourism role in fostering social sustainability: Qatar youth perceptions. *Frontiers in Sports and Active Living, 6*, Article 1388123. https://doi.org/10.3389/fspor.2024.1388123

Ishac, W., Javani, V., & Youssef, D. (2024). Leveraging sentiment analysis of Arabic tweets for the 2022 FIFA World Cup insights. *Managing Sport and Leisure*. https://doi.org/10.1080/23750472.2024.2342258

Ishac, W., & Swart, K. (2022). Social impact projections for Qatar youth residents from 2022. *Frontiers in Sports and Active Living, 4*, Article 922997. https://doi.org/10.3389/fspor.2022.922997

Jarvie, G., & Yujun, X. (2022). *Qatar 2022: Facts, myth and issues*. University of Edinburgh.

Kerry, L., Aguerrebere, P. M., Burgess, S., & Chadli, L. (2024). Branding countries through multicultural events: A quantitative analysis of the impact of the FIFA World Cup 2022 on Qatar's brand. *Frontiers in Communication, 9*, Article 1337088. https://doi.org/10.3389/fcomm.2024.1337088

Kozhanov, N., Amara, M., & Zweiri, M. (Eds.). (2024). *The 2022 FIFA World Cup in Qatar: Global and local perspectives*. Taylor & Francis. https://doi.org/10.4324/9781003453246

Levac, D., Colquhoun, H., & O'Brien, K. K. (2010). Scoping studies: Advancing the methodology. *Implementation Science, 5*(1), 69. https://doi.org/10.1186/1748-5908-5-69

Luo, Y., Choi, J. A., Andon, S. P., Benton, B., Green, K., & Strudler, K. (2022). *Protests and calls for boycotting the Qatar World Cup 2022 spark online discussion and action away from the soccer pitch*. Montclair State University.

Mohamadi Turkmani, E., Nassif, N., Houhou, K., Włodarczyk, A., & Javid, M. (2024). Social capital building through mega-sporting events: Did the Qatar 2022 World Cup foster bonding, bridging, and linking social capital? *International Review for the Sociology of Sport*. https://doi.org/10.1177/10126902241297415

Munzilin. (2024). *The FIFA World Cup Qatar 2022 (24 case studies)*. OAPEN. https://library.oapen.org/handle/20.500.12657/104168

Mustafa, A. A. A. (2023). The role of contemporary Islamic outreach methods in spreading Islam: Qatar 2022 World Cup as a model. *University of Omdurman Islamic Sciences Journal, 1*(1), 99–118. http://search.mandumah.com/Record/1557903

Parvez, Z. (2024). The FIFA World Cup 2022, national identity, and the politics of women's sports participation in Qatar. *Asian Journal of Sport History & Culture, 3*(2), 154–179. https://doi.org/10.1080/27690148.2024.2341256

Peters, M. D. J., Godfrey, C., McInerney, P., Munn, Z., Tricco, A. C., & Khalil, H. (2020). Guidance for conducting systematic scoping reviews. *JBI Evidence Synthesis, 18*(10), 2119–2126. https://doi.org/10.11124/JBIES-20-00167

Qatar Foundation. (2023). *Driving social progress: Qatar Foundation's World Cup story*. https://stories.qf.org.qa/world-cup/driving-social-change/

Rizana, A. H., & Lisnarini, N. (2023). The role of FIFA World Cup Qatar 2022 brand ambassador: An analysis of Ghanim Al Muftah in promoting inclusive engagement. *COMMICAST, 4*(2), 61–70. https://doi.org/10.12928/commicast.v4i2.8996

Sammour, K. (2023). Qatar 2022 World Cup cultural celebration: An Arabic model of cultural diplomacy. *Contemporary Studies in Social Sciences, 1*(2), 133–145. https://doi.org/10.31559/CSSS2023.1.2.4

Solimane, M. T., & Elfekair, M. (2024). The impact of the FIFA World Cup Qatar 2022 on the intention to visit the host nation. *Journal of Human Development and Economics, 15*(2), 68–84. https://asjp.cerist.dz/en/article/259945

Tricco, A. C., Lillie, E., Zarin, W., O'Brien, K. K., Colquhoun, H., Levac, D., … Straus, S. E. (2018). PRISMA extension for scoping reviews (PRISMA-ScR): Checklist and explanation. *Annals of Internal Medicine, 169*(7), 467–473. https://doi.org/10.7326/M18-0850

Ulrichsen, K. C. (2023). Qatar and the 2022 FIFA World Cup. In *Soft power, state branding, and the 2022 FIFA World Cup*. Taylor & Francis. https://doi.org/10.4324/9781003348238-18

UNESCO. (2021). *Fit for life: Youth and sport for sustainable development*. United Nations Educational, Scientific and Cultural Organization. https://en.unesco.org/themes/sport-and-anti-doping/youth

United Nations. (2015). *Transforming our world: The 2030 Agenda for Sustainable Development*. https://sdgs.un.org/2030agenda

Yaylali, M. S. (2025). *Mega sports events and national identity: The case of Qatar World Cup 2022*. Qatar University. https://qspace.qu.edu.qa/handle/10576/62739

Youssef, D., & Ishac, W. (2024). Social media, sentiment analysis, and youth engagement during FIFA World Cup 2022 in Qatar. *Global Journal of Sport and Society, 6*(2), 35–60.

Zhang, C. (2024). Impact of the 2022 FIFA World Cup on Qatar. *International Journal of Social Science and Humanity, 14*(5), 175–180. https://www.ijssh.net/uploadfile/2024/IJSSH-V14N5-1225.pdf

Zhao, Y., & Liu, Y. (2024). Impact of the 2022 FIFA World Cup on Qatar. *International Journal of Social Science and Humanity, 14*(5), 225–230.

Zimbalist, A. (2015). *Circus maximus: The economic gamble behind hosting the Olympics and the World Cup*. Brookings Institution Press. http://www.jstor.org/stable/10.7864/j.ctt1287brp

DOI 10.26773/jaspe.260705

Journal of Anthropology of Sport and Physical Education

ORIGINAL SCIENTIFIC PAPER

Can Sport Events Reduce Tourism Seasonality? Evidence from an Emerging Coastal Destination

Brixhilda Imeri[1]

[1]Aleksander Moisiu University, Faculty of Business, Durres, Albania

Abstract

Sport events are increasingly considered strategic tools for destination marketing and tourism diversification. Tourism seasonality remains a persistent structural challenge for coastal destinations, where visitor arrivals are concentrated within a limited number of peak months. This study examines tourism seasonality patterns in Albania and explores whether sports events can help reduce seasonal concentration in tourism demand. The analysis is based on monthly tourism data for the period 2018–2025, comprising 96 observations of visitor arrivals and overnight stays in accommodation establishments. Descriptive statistics were used to identify seasonal patterns, while a one-way analysis of variance (ANOVA) tested whether tourism demand differs across months. Additionally, an independent-samples t-test examined differences between months that hosted major sports events and non-event months. The findings reveal a pronounced seasonal pattern, with international visitor arrivals peaking in July and August and significantly lower during the winter months. ANOVA results indicate statistically significant variation across months (Welch ANOVA: $F(11, 32.7) = 3.85$, $p = 0.001$), confirming strong tourism seasonality. However, no statistically significant difference was found between event and non-event months ($t(94) = -0.064$, $p = 0.949$). The findings indicate that sport events held in shoulder seasons are not associated with statistically significant changes in international tourism demand. This suggests that participation-based sport events, at their current scale, have limited capacity to influence mobility patterns. From a sport science perspective, the results highlight the importance of event scale and integration within broader sport systems in shaping seasonal tourism dynamics.

Keywords: *tourism seasonality, sport tourism, tourism demand, seasonal variation, Albania*

Introduction

Tourism seasonality is widely recognised as one of the most persistent structural challenges affecting tourism development, particularly in coastal destinations where tourism demand is highly concentrated during specific periods of the year. Seasonality leads to uneven resource utilisation, labour market instability, and inefficiencies in tourism infrastructure, thereby limiting the long-term sustainability of tourism systems (Butler, 1998). Similar constraints have been documented in rural destinations, where seasonality is identified as a limiting factor for sustainable tourism development (Martin Martin et al., 2020). In many coastal regions, tourism activity is strongly influenced by climatic conditions, institutionalised holiday periods, and leisure travel preferences, resulting in a pronounced concentration of visitor arrivals during the summer months (Koenig-Lewis & Bischoff, 2005). The concentration of tourism demand within a limited time frame creates significant economic and operational imbalances. High-season congestion is often accompanied by underutilisation of tourism capacity during the off-season, which reduces profitability and increases the vulnerability of tourism-dependent destinations (Amelung, Nicholls, & Viner, 2007). As a result, addressing tourism seasonality has become a central concern for both researchers and policymakers, particularly in emerging tourism destinations seeking to achieve more balanced and sustainable tourism development. One strategy increasingly discussed in the literature for mitigating tourism seasonality is the development

Correspondence:

B. Imeri
Aleksandër Moisiu University, Faculty of Business, Department of Marketing, Durrës, Albania
E-mail: brixhildaimeri@uamd.edu.al

of event-based tourism. Events are considered important instruments for attracting visitors, enhancing destination visibility, and diversifying tourism products (Getz, 2008). In particular, sports events have been identified as effective tools for stimulating tourism activity outside the traditional peak season, as they can attract participants, spectators, and media attention, thereby generating both direct and indirect tourism impacts (Higham & Hinch, 2002). Shoulder seasons, the transitional spring and autumn periods with intermediate tourism demand, are considered particularly valuable for stimulating visitor arrivals and reducing seasonal concentration. Sport tourism, as a growing segment of the global tourism market, offers destinations opportunities to broaden their tourism offerings and reduce their dependence on seasonal leisure tourism. Regional evidence also highlights the role of sport tourism in positioning destinations such as Montenegro as high-quality sports tourism hubs, reinforcing its potential to mitigate seasonality (Jaksic-Stojanovic, Jankovic, & Seric, 2019). Previous studies suggest that sport events attract specialised visitor segments such as active participants and create engagement with the destination (Shipway & Jones, 2007). However, the extent to which sports events can effectively reduce tourism seasonality remains an open empirical question, particularly in emerging tourism contexts where tourism systems are still developing.

In Albania, tourism has experienced rapid growth driven largely by coastal tourism, yet demand remains strongly seasonal with visitor arrivals concentrated during summer months (Dhimitri, Çinaj, Brakaj, Qosja, Dibra, & Mbrica, 2025). Albania has increasingly hosted sporting events such as marathons held in spring and autumn, suggesting potential for tourism diversification. However, empirical research examining the relationship between sport events and tourism seasonality in this context remains limited.

Therefore, the purpose of this study is to examine tourism seasonality patterns in Albania and to explore whether sporting events may help mitigate seasonal concentration in tourism demand. By combining secondary tourism data with information on the timing of major sports events, this study aims to provide empirical evidence on the role of sports events as a potential tool for addressing tourism seasonality in an emerging tourism destination. Previous research in the Albanian hospitality sector has also highlighted structural limitations in market development and governance, which may influence tourism dynamics and the effectiveness of strategic interventions (Imeri & Rustani, 2025).

This study contributes to the sport science and sport tourism literature by challenging the assumption that sport events inherently generate measurable macro-level tourism impacts. Empirical evidence is provided that small-scale participation-based events may not be sufficient to alter aggregate mobility patterns, shifting the analytical focus from the mere presence of events to their scale, structure, and integration within broader sport systems.

Methods

Research Design

This study adopts an exploratory quantitative research design based on secondary data analysis. The objective is to examine tourism seasonality patterns and to assess whether the occurrence of sports events is associated with changes in international tourism demand. Given the aggregate nature of the available data, the analysis focuses on identifying temporal patterns rather than establishing causal relationships. This study used publicly available aggregated secondary data from INSTAT (https://www.instat.gov.al) and did not involve human or animal participants. No individual-level or sensitive data were used. Therefore, institutional ethics approval was not required.

Data Sources and Sample

The data were obtained from publicly accessible databases provided by INSTAT. No formal permissions or data access requests were required, as the dataset is openly available for research use.

The data include information on tourism activity in accommodation establishments, specifically:

- total number of visitors;
- number of foreign visitors;
- number of overnight stays.

These indicators are commonly used in tourism research to measure tourism demand and seasonal fluctuations.

In addition to tourism data, information on major sports events organised in Albania during the same period was compiled from publicly available sources, including official event websites and organiser announcements. The event month was operationalised as a binary variable coded 1 for months with verified participation-based sport events and 0 otherwise. This study focuses specifically on participation-based endurance events open to recreational participants, as distinguished from spectator-oriented or elite-only competitions (Higham & Hinch, 2002). Two recurring event types were identified: (1) the Maratona e Ditës së Dëshmorevë "5 Maj" (Martyrs' Day Marathon), an annual endurance race held in Durrës on May 5, organised by Shoqata Maraton Albania; and (2) the Tirana Marathon, a mass-participation running event held annually in October, organised by the Municipality of Tirana. May and October were therefore selected as the primary event months. Months in which tourism was severely disrupted by the COVID-19 pandemic (May 2020, October 2020) or in which no events were documented (May 2021) were coded 0, resulting in 13 event months across 2018–2025 (see Appendix, Table A1). It is noted that Albania also hosted several large-scale international competitions during the study period, including the European Senior Weightlifting Championships (May 2022), the U23 and Senior World Wrestling Championships (October 2024), and the Giro d'Italia (May 2025). These were excluded due to their elite-participant profile and spectator orientation, which differ substantially from the participation-based events under study (see Table A2).

Variables and Operationalisation

The main variables used in the analysis are:

Foreign visitors (dependent variable): number of international visitors in accommodation establishments, used as the primary indicator of tourism demand.

Month: categorical variable representing the twelve months of the year, used to capture seasonal variation.

Event month: binary variable indicating whether at least one major sport event took place in a given month (1 = event month; 0 = non-event month).

Foreign visitors were selected as the key dependent variable because they better reflect international tourism demand and are more sensitive to destination attractiveness and event-related travel.

Data Analysis

Statistical analyses were conducted using Jamovi. The analytical approach consists of three main steps.

First, descriptive statistics were calculated to summarise tourism activity and to identify general patterns in visitor arrivals and overnight stays. Monthly averages were computed to examine the distribution of tourism demand across the year.

Second, a one-way analysis of variance (ANOVA) was conducted to test whether tourism demand differs significantly across months. Due to unequal variances across groups, the Welch ANOVA was used. This approach is considered appropriate when the assumption of homogeneity of variances is violated. Post hoc comparisons were performed using the Tukey test in order to

identify specific differences between months.

Third, an independent-samples t-test was conducted to examine whether months hosting sporting events differ from non-event months in international visitor arrivals. This analysis assesses whether sports events are associated with observable differences in tourism demand at the monthly level.

Prior to conducting the main analyses, normality was assessed using the Shapiro-Wilk test. The Shapiro-Wilk test indicated a significant departure from normality in the distribution of foreign visitor arrivals ($W = 0.876$, $p < 0.001$). Levene's test confirmed significantly unequal variances across monthly groups ($F(11, 84) = 5.48$, $p < 0.001$). Welch's ANOVA was therefore applied as the appropriate alternative to the standard one-way ANOVA.

Results

Descriptive statistics for tourism activity in Albania over the period 2018–2025 are presented in Table 1. The dataset comprises 96 monthly observations and indicates substantial variability in tourism demand across the year. The average number of total visitors was 163,323 per month (SD = 158,421), while the mean number of foreign visitors was 104,658 (SD = 118,302). The average number of overnight stays was 396,631 (SD = 436,728). These results indicate significant fluctuations in tourism activity and a pronounced seasonal pattern.

Table 1. Descriptive Statistics of Tourism Activity (2018–2025)

Variable	N	Mean	SD	Minimum	Maximum
Total visitors	96	163,323	158,421	0	878,901
Foreign visitors	96	104,658	118,302	0	650,108
Overnight stays	96	396,631	436,728	0	2,263,355

Note. Data based on monthly tourism statistics for accommodation establishments. Minimum values of 0 reflect April 2020, when Albania's tourism sector was fully closed due to COVID-19 restrictions.

The analysis of monthly averages (Table 2) reveals a clear concentration of tourism demand during the summer period. The number of foreign visitors increases gradually from winter to summer, with the lowest average values observed in January (M = 30,867) and February (M = 32,533). Tourism demand then rises steadily throughout spring, reaching its peak in July (M = 225,673) and August (M = 276,709). Following the summer peak, visitor numbers decline sharply during the autumn and winter months. The difference between peak and off-peak periods is substantial, with summer tourism demand nearly 9 times higher than in winter months. This pattern is further illustrated in Figure 1, which shows the seasonal distribution of international visitor arrivals.

Table 2. Average Monthly Number of Foreign Visitors (2018–2025)

Month	N	Mean	SD
January	8	30,867	19,410
February	8	32,533	20,747
March	8	37,132	27,124
April	8	62,530	51,650
May	8	97,150	79,049
June	8	147,123	118,501
July	8	225,673	151,505
August	8	276,709	188,994
September	8	162,314	126,880
October	8	82,663	70,918
November	8	55,259	38,123
December	8	45,946	31,665

To statistically assess whether tourism demand differs across months, a one-way analysis of variance (ANOVA) was conducted using foreign visitor arrivals as the dependent variable. The results indicate a statistically significant effect of month on tourism demand (Welch ANOVA: $F(11, 32.7) = 3.85$, $p = 0.001$), confirming strong tourism seasonality (Table 3). Post hoc comparisons using the Tukey test identified 14 significant pairwise differences ($p < 0.05$). August differed significantly from January ($p < 0.001$), February ($p < 0.001$), March ($p < 0.001$), April ($p = 0.001$), May ($p = 0.013$), October ($p = 0.005$), November ($p < 0.001$), and December ($p < 0.001$). July differed significantly from January ($p = 0.005$), February ($p = 0.005$), March ($p = 0.007$), April ($p = 0.038$), November ($p = 0.024$), and December ($p = 0.013$). No significant differences were found among winter months or among shoulder-season months. These results confirm a pronounced concentration of international tourism demand during the peak summer months of July and August.

In addition to examining seasonal patterns, the analysis investigated whether the occurrence of sports events is associated with differences in tourism demand. An independent-samples t-test (Student's t, equal variances assumed) was conducted to compare months with sport events to months without such events (Table 4). Event months (n = 13) recorded a mean of 106,622 foreign visitors (SD = 70,535), while non-event months (n = 83) recorded a mean of 104,351 (SD = 124,441). The results indicate that the difference between the two groups is not statistically significant ($t(94) = -0.064$, $p = 0.949$). This finding suggests that the presence of sports events does not immediately produce a measurable increase in monthly international visitor arrivals at the aggregate level. This finding may be explained by the nature of sport events in emerging destinations. Many events are relatively small-scale and primarily attract local or regional participants rather than in-

Table 3. One-Way ANOVA Results for Monthly Differences in Foreign Visitor Arrivals.

Month	N	M	SD	F	df1	df2	p
January	8	30,867	19,410				
February	8	32,533	20,747				
March	8	37,132	27,124				
April	8	62,530	51,650				
May	8	97,150	79,049				
June	8	147,123	118,501				
July	8	225,673	151,505				
August	8	276,709	188,994				
September	8	162,314	126,880				
October	8	82,663	70,918				
November	8	55,259	38,123				
December	8	45,946	31,665				
Welch ANOVA				3.85	11	32.7	0.001

Note. Welch ANOVA was used due to unequal variances.

Table 4. Independent Samples t-test Comparing Event Months and Non-event Months.

Group	N	M	SD	t	df	p
Event months	13	106,622	70,535	−0.064	94	0.949
Non-event months	83	104,351	124,441			

Note. Event months (n = 13) represent months with verified major sporting events across 2018–2025. May and October months affected by COVID-19 restrictions (2020) and the absence of documented events (May 2021) were coded as non-event months (0), yielding n = 13 event months and n = 83 non-event months. Student's t-test (equal variances assumed). No statistically significant difference was found between event and non-event months.

ternational sport tourists. In addition, the limited integration of sport event planning within broader sport and tourism development strategies may reduce their capacity to influence aggregate mobility patterns. From a sport science perspective, this suggests that not all sport participation events are equally capable of generating measurable changes in population-level behaviour.

Overall, the results confirm the existence of a pronounced and statistically significant seasonal pattern in tourism demand in Albania, while indicating that sport events, although potentially relevant for destination marketing and tourism diversification, do not have a direct short-term impact on aggregate tourism volumes. The sensitivity analysis excluding 2020 yielded consistent results: the seasonal pattern remained highly significant (Welch ANOVA: $F(11, 28.1) = 4.39$, $p < 0.001$), and the event vs. non-event comparison remained non-significant ($t(82) = 0.304$, $p = 0.762$), confirming that COVID-19-affected observations did not distort the findings.

Discussion

The results confirm a pronounced seasonal pattern in Albania's tourism sector. International visitor numbers peak in July and August and decline sharply during winter, consistent with research identifying climatic conditions and institutional vacation periods as primary drivers of seasonal concentration (Butler, 1998; Koenig-Lewis & Bischoff, 2005). Post hoc comparisons confirm significant differences between peak summer months and the winter period, as well documented in Mediterranean coastal destinations (Amelung et al., 2007).

In addition to examining seasonality patterns, this study explored whether sports events can help mitigate tourism seasonality. Sport events are frequently considered strategic tools for destination marketing and tourism diversification because they attract participants and spectators while generating media exposure for the destination (Getz, 2008). In many cases, sports events are intentionally scheduled during shoulder seasons in order to stimulate tourism activity outside the traditional peak season (Higham & Hinch, 2009).

However, the statistical analysis did not reveal a significant difference between event and non-event months, suggesting that participation-based sport events do not produce measurable changes in aggregate monthly tourism demand. The tourism impact of sport events is often indirect, depending on event scale, marketing strategies, and long-term image effects (Weed & Bull, 2009). Recent research in Albania has highlighted structural challenges in tourism systems related to trust and market maturity (Imeri & Rustani, 2025), which may reduce their effectiveness as diversification tools. This aligns with research identifying sport tourism as a strategic tool for managing seasonality (Higham, 2006). Sport events should therefore be interpreted as components of broader sport participation systems rather than isolated short-term stimulators.

The findings indicate that participation-based sport events, at their current scale, do not generate measurable changes in aggregate tourism demand. This highlights the importance of event scale and international reach in shaping tourism impacts. Unlike mega-events, which attract substantial international flows, smaller participation-based events tend to operate at local or regional levels, limiting their influence on overall tourism volumes. Therefore, the effectiveness of sport events as a tool for reducing seasonality depends on their strategic integration within broader sport and tourism systems rather than their mere occurrence.

For emerging destinations such as Albania, integrating sports events into tourism development strategies may help diversify tourism offerings and boost tourism activity during non-peak periods. This approach may help reduce seasonal imbalances while strengthening the destination's competitiveness in the interna-

tional tourism market.

This study relies on aggregated secondary data, which limits the ability to capture individual-level behaviour or causal relationships. The analysis focuses on national-level data, which may mask regional variations. The event variable was restricted to participation-based endurance events, excluding large-scale international competitions hosted during the study period (e.g., European Senior Weightlifting Championships, May 2022; World Wrestling Championships, October 2024; Giro d'Italia, May 2025). Their exclusion limits the generalisability of the findings to the broader category of sport events, and future research should examine whether larger-scale events produce measurable tourism impacts.

Furthermore, operationalising sport events as a binary variable does not account for differences in event scale, type, or visitor impact. As a result, the findings should be interpreted as indicative of general patterns rather than definitive causal effects. Other studies have proposed more advanced statistical approaches to decompose and test changes in the seasonal concentration of tourist flows (Grossi & Mussini, 2021).

Despite these limitations, the use of official statistical data and established analytical techniques provides a preliminary basis for examining tourism seasonality and exploring the potential role of sports events in an emerging tourism destination.

Conclusion

This study examined tourism seasonality patterns in Albania and explored the potential role of sports events in reducing seasonal concentration of tourism. Using monthly tourism statistics covering the period 2018–2025, the analysis identified a pronounced seasonal pattern characterised by a substantial concentration of tourism activity during the summer months. The results indicate that tourism demand varies significantly across months, with July and August representing the peak of international tourism arrivals. The analysis, therefore, demonstrates that tourism seasonality remains a key structural characteristic of Albania's tourism sector.

The results also indicate that months hosting sports events do not significantly differ from non-event months in terms of international visitor arrivals. While this suggests that sports events do not produce an immediate measurable increase in tourism demand, their broader contribution to destination marketing and tourism diversification should not be overlooked.

Future research may further investigate the tourism impacts of sport events by incorporating additional variables, such as visitor expenditure, event participation, and perceptions of destination image. Expanding the analysis to include regional tourism data or specific event case studies may also provide deeper insights into the role of sports events in tourism development in emerging destinations. From a sport science perspective, sport events should be understood as components of broader sport participation systems rather than isolated interventions. Their effectiveness depends on scale, integration, and their ability to attract active participants beyond local contexts. The findings suggest that the role of sport events in shaping tourism seasonality should be reconsidered within a broader sport systems perspective, where scale and structural integration are central determinants of impact.

Conflict of Interest
The author declares no conflict of interest.

Received: 20 April 2026; **Accepted:** 29 June 2026; **Published:** 15 July 2026

References

Albanian Telegraph Agency (ATA). (2019, August 2). Tirana Marathon, on October 13. Retrieved from https://en.ata.gov.al/2019/08/02/tirana-marathon-on-october-13/

Amelung, B., Nicholls, S., & Viner, D. (2007). Implications of global climate change for tourism flows and seasonality. *Journal of Travel Research, 45*(3), 285–296. doi:10.1177/0047287506295937

Butler, R. W. (1998). Seasonality in tourism: Issues and implications. *The Tourist Review, 53*(3), 18–24. doi:10.1108/eb058278

Dhimitri, J., Çinaj, N., Brakaj, E. P., Qosja, E., Dibra, M., & Mbrica, A. (2025). Stakeholder insights on tourism seasonality and destination performance along the Albanian Adriatic coast. *GeoJournal of Tourism and Geosites, 61*(3), 1944–1951. doi:10.30892/gtg.61351-1561

Getz, D. (2008). Event tourism: Definition, evolution, and research. *Tourism Management, 29*(3), 403–428. doi:10.1016/j.tourman.2007.07.017

Grossi, L., & Mussini, M. (2021). Seasonality in tourist flows: Decomposing and testing changes in seasonal concentration. *Tourism Management, 84*, 104289. doi:10.1016/j.tourman.2021.104289

Higham, J. (2006). Sport tourism as an attraction for managing seasonality. *Journal of Sport & Tourism, 11*(3–4), 238–262. doi:10.1080/17430430500087419

Higham, J., & Hinch, T. (2002). Tourism, sport and seasons: The challenges and potential of overcoming seasonality in the sport and tourism sectors. *Tourism Management, 23*(2), 175–185. doi:10.1016/S0261-5177(01)00046-2

Higham, J., & Hinch, T. (2009). *Sport and tourism* (1st ed.). London, UK: Routledge. doi:10.4324/9780080942643

Imeri, B., & Rustani, M. (2025). Dark patterns in digital hospitality platforms: Ethical and legal challenges for Albania's tourism sector. *Interdisciplinary Journal of Research and Development, 12*(3), 111–120. doi:10.56345/ijrdv12n313

INSTAT. (2025). *Tourism statistics in Albania*. Tirana, Albania: Institute of Statistics. Retrieved from https://www.instat.gov.al

Jaksic-Stojanovic, A., Jankovic, M., & Seric, N. (2019). Montenegro as high-quality sports tourism destination: Trends and perspectives. *Sport Mont, 17*(1), 93–95. doi:10.26773/smj.190218

Koenig-Lewis, N., & Bischoff, E. E. (2005). Seasonality research: The state of the art. *International Journal of Tourism Research, 7*(4–5), 201–219. doi:10.1002/jtr.531

Maraton Albania. (2024). Maratona e Ditës së Dëshmorevë "5 Maj". Retrieved from https://maratonalbania.al

Martin Martin, J. M., Salinas Fernandez, J. A., Rodriguez Martin, J. A., & Ostos Rey, M. S. (2020). An analysis of tourism seasonality as a factor limiting the sustainable development of rural destinations. *Journal of Hospitality & Tourism Research, 44*(1), 45–75. doi:10.1177/1096348019876688

Shipway, R., & Jones, I. (2007). Running away from home: Understanding visitor experiences and behaviour at sport tourism events. *International Journal of Tourism Research, 9*(5), 373–383. doi:10.1002/jtr.641

Tirana Marathon. (2025). Tirana Marathon official website. Municipality of Tirana & Albanian Athletics Federation. Retrieved from https://tiranamarathon.com/en/

Tirana Times. (2018, October 12). Tirana Marathon 2018 comes in its third edition. Retrieved from https://www.tiranatimes.com/tirana-marathon-2018-comes-in-its-third-edition/

Weed, M., & Bull, C. (2009). *Sports tourism: Participants, policy and providers* (1st ed.). London, UK: Routledge. doi:10.4324/9780080942117

Guidelines for Authors

Revised October 2017

*** Please use the bookmark function to navigate within the guidelines. ***

When preparing the final version of the manuscripts, either NEW or REVISED authors should strictly follow the guidelines. Manuscripts departing substantially from the guidelines will be returned to the authors for revision or, rejected.

1. UNIFORM REQUIREMENTS

1.1. Overview

The *Journal of Anthropology of Sport and Physical Education* (JASPE) applies the Creative Commons Attribution (CC BY) license to articles and other works it publishes.

There is no charge for submissions and no page charge for accepted manuscripts. However, if the manuscript contains graphics in color, note that printing in color is charged.

JASPE adopts a double-blind approach for peer reviewing in which the reviewer's name is always concealed from the submitting authors as well as the author(s)'s name from the selected reviewers.

JASPE honors six-weeks for an initial decision of manuscript submission.

Authors should submit the manuscripts as one Microsoft Word (.doc) file.

Manuscripts must be provided either in standard UK or US English or Montenegrin language. Chosen language standards should be consistent throughout the manuscripts.

Format the manuscript in A4 paper size; margins are 1 inch or 2.5 cm all around.

Type the whole manuscript double-spaced, justified alignment.

Use Times New Roman font, size eleven (11) point.

Number (Arabic numerals) the pages consecutively (centering at the bottom of each page), beginning with the title page as page 1 and ending with the Figure legend page.

Include line numbers (continuous) for the convenience of the reviewers.

Apart from chapter headings and sub-headings avoid any kind of formatting in the main text of the manuscripts.

1.2. Type & Length

JASPE publishes following types of papers:

Original scientific papers are the results of empirically- or theoretically-based scientific research, which employ scientific methods, and which report experimental or observational aspects of anthropology of sport and physical education from five major fields of anthropology: cultural, global, biological, linguistic and medical. Descriptive analyses or data inferences should include rigorous methodological structure as well as sound theory. Your manuscript should include the following sections: Introduction, Methods, Results, and Discussion.

☑Open Submissions ☑Indexed ☑Peer Reviewed

Original scientific papers should be:

- Up to 3000 words (excluding title, abstract, tables/figures, figure legends, Acknowledgements, Conflict of Interest, and References);
- A structured abstract of less than 250 words;
- Maximum number of references is 30;
- Maximum combined total of 6 Tables/Figures.

Review papers should provide concise in-depth reviews of both established and new areas, based on a critical examination of the literature, analyzing the various approaches to a specific topic in all aspects of anthropology of sport and physical education from five major fields of anthropology: cultural, global, biological, linguistic and medical.

☑Open Submissions ☑Indexed ☑Peer Reviewed

Review papers should be:
- Up to 6000 words (excluding title, abstract, tables/figures, figure legends, Acknowledgements, Conflict of Interest, and References);
- A structured abstract of less than 250 words;
- Maximum number of references is 100.

Editorials are written or commissioned by the editors, but suggestions for possible topics and authors are welcome. It could be peer reviewed by two reviewers who may be external or by the Editorial Board.

☐Open Submissions ☑Indexed ☑Peer Reviewed

Editorials should be:
- Up to 1000 words (excluding title, abstract, tables/figures, figure legends, Acknowledgements, Conflict of Interest, and References);
- A structured abstract of less than 250 words;
- Maximum number of references is 10.

Short reports of experimental work, new methods, or a preliminary report can be accepted as two page papers. Your manuscript should include the following sections: Introduction, Methods, Results, and Discussion.

☑Open Submissions ☑Indexed ☑Peer Reviewed

Short reports should be:
- Up to 1500 words (excluding title, abstract, tables/figures, figure legends, Acknowledgements, Conflict of Interest, and References);
- A structured abstract of less than 250 words;
- Maximum number of references is 15.

Peer review - fair review provides authors who feel their paper has been unfairly rejected (at any journal) the opportunity to share reviewer comments, explain their concerns, and have their paper reviewed for possible publication in JASPE.

☑Open Submissions ☑Indexed ☐Peer Reviewed

Peer review - fair review should be:
- Up to 1500 words (excluding title, abstract, tables/figures, figure legends, Acknowledgements, Conflict of Interest, and References);
- A structured abstract of less than 250 words;
- Maximum number of references is 15.

Invited papers and award papers include invited papers from authors with outstanding scientific credentials. Nomination of invited authors is at the discretion of the JASPE editorial board. JASPE also publishes award papers selected by the scientific committee of the publisher's conferences.

☐Open Submissions ☑Indexed ☐Peer Reviewed

Invited papers and award papers should be:
- Up to 3000 words (excluding title, abstract, tables/figures, figure legends, Acknowledgements, Conflict of Interest, and References);
- A structured abstract of less than 250 words;
- Maximum number of references is 30;
- Maximum combined total of 6 Tables/Figures.

1.3. Submission

JASPE only accepts electronic submission to the e-mail of the Journal Office: **office.jaspe.mne@gmail.com; vasileva.jaspe@gmail.com**.

Submitted material includes:

- A manuscript prepared according to the Guidelines for the Authors;
- A signed form that states the study was not previously published, nor has been submitted simultaneously for consideration of publication elsewhere, that states that all of the authors are in agreement with submission of the manuscript to JASPE, and that, for studies that use animal or human individuals, authors must include information regarding their institution's ethics committee, and which identifies the official approval number;
- A signed form that there is no conflict of interest.

Name the files according to the family name of the first author. Authors submitting revised versions of the manuscript can use the identification number of their manuscript as provided by the Journal Office. *See* example:

- ✓ FAMILY NAME-manuscript.doc – (main manuscript file)
- ✓ FAMILY NAME-statement.PDF – (authorship statement)
- ✓ FAMILY NAME-declaration.PDF – (declaration of potential conflict of interest)
- ✓ FAMILY NAME-fig1.tiff – (Figure 1)

1.4. Peer Review Process

A manuscript submitted for publication will be submitted to the review process as long as it fits the following criteria:

- The study was not previously published, nor has been submitted simultaneously for consideration of publication elsewhere;
- All persons listed as authors approved its submission to JASPE;
- Any person cited as a source of personal communication has approved the quote;
- The opinions expressed by the authors are their exclusive responsibility;
- The author signs a formal statement that the submitted manuscript complies with the directions and guidelines of JASPE.

The editors-in-chief and associate editors will make a preliminary analysis regarding the appropriateness, quality, originality and written style/grammar of the submitted manuscript. The editors reserve the right to request additional information, corrections, and guideline compliance before they submit the manuscript to the ad-hoc review process.

JASPE uses ad-hoc reviewers, who volunteer to analyze the merit of the study. Typically, one or two expert reviewers are consulted in a double-blind process. Authors are notified by e-mail when their submission has been accepted (or rejected). Minor changes in the text may be made at the discretion of the editors-in-chief and/or associate editors. Changes can include spelling and grammar in the chosen language, written style, journal citations, and reference guidelines. The author is notified of changes via email. The final version is available to the author for his or her approval before it is published.

1.5. Open Access License and Publisher Copyright Policies

JASPE applies the Creative Commons Attribution (CC BY) license to articles and other works it publishes. If author(s) submit its paper for publication by JASPE, they agree to have the CC BY license applied to their work. Under this Open Access license, the author(s) agree that anyone can reuse their article in whole or part for any purpose, for free, even for commercial purposes. Anyone may copy, distribute, or reuse the content as long as the author(s) and original source are properly cited. This facilitates freedom in re-use and also ensures that JASPE content can be mined without barriers for the needs of research. On the other hand, the author(s) may use content owned by someone else in their article if they have written permission to do so. If the manuscript contains content such as photos, images, figures, tables, audio files, videos, et cetera, that the author(s) do not own, JASPE will require them to provide it with proof that the owner of that content has given them written permission to use it, and has approved of the CC BY license being applied to their content. Otherwise, JASPE will ask the author(s) to remove that content and/or replace it with other content that you own or have such permission to use. JASPE provides a form the author(s) can use to ask for and obtain permission from the owner.

In addition, the author(s) may freely use the content they previously published in a paper through another publisher and they own the rights to that content; however, that's not necessarily the case and it depends on the license that covers the other paper. Some publishers allow free and unrestricted reuse of article content they own, such as under the CC BY

license. Other publishers use licenses that allow reuse only if the same license is applied by the person or publisher reusing the content. If the article was published under a CC BY license or another license that allows free and unrestricted use, the author(s) may use the content in the submitted manuscript provided that the author(s) give proper attribution, as explained above. If the content was published under a more restrictive license, the author(s) must ascertain what rights they have under that license. JASPE advices the author(s) not to include any content in the submitted manuscript which they do not have rights to use, and always give proper attribution.

The editors of JASPE consider plagiarism to be a serious breach of academic ethics. Any author who practices plagiarism (in part or totality) will be suspended for six years from submitting new submissions to JASPE. If such a manuscript is approved and published, public exposure of the article with a printed mark ("plagiarized" or "retracted") on each page of the published file, as well as suspension for future publication for at least six years, or a period determined by the editorial board. Third party plagiarized authors or institutions will be notified, informing them about the faulty authors. Plagiarism will result in immediate rejection of the manuscript.

JASPE only publishes studies that have been approved by an institutional ethics committee (when a study involves humans or animals). Fail to provide such information prevent its publication. To ensure these requirements, it is essential that submission documentation is complete. If you have not completed this step yet, go to JASPE website and fill out the two required documents: Declaration of Potential Conflict of Interest and Authorship Statement. Whether or not your study uses humans or animals, these documents must be completed and signed by all authors and attached as supplementary files in the originally submitted manuscript.

1.6. After Acceptance

After the manuscript has been accepted, authors will receive a PDF version of the manuscripts for authorization, as it should look in printed version of JASPE. Authors should carefully check for omissions. Reporting errors after this point will not be possible and the Editorial Board will not be eligible for them.

Should there be any errors, authors should report them to the Office e-mail address **jaspe@ucg.ac.me.** If there are not any errors authors should also write a short e-mail stating that they agree with the received version.

1.7. Code of Conduct Ethics Committee of Publications

JASPE is hosting the Code of Conduct Ethics Committee of Publications of the **COPE** (the Committee on Publication Ethics), which provides a forum for publishers and Editors of scientific journals to discuss issues relating to the integrity of the work submitted to or published in their journals.

2. MANUSCRIPT STRUCTURE

2.1. Title Page

The first page of the manuscripts should be the title page, containing: title, type of publication, running head, authors, affiliations, corresponding author, and manuscript information. *See* example:

Analysis of Dietary Intake and Body Composition of Female Athletes over a Competitive Season

Original Scientific Paper

Diet and Body Composition of Female Athletes

Svetlana Nepocatych[1], Gytis Balilionis[1], Eric K. O'Neal[2]

[1]Elon University, Department of Exercise Science1, Elon, NC 27215
[2]University of North Alabama, Department of Health, Physical Education and Recreation, Florence, AL 35632

Corresponding author:

S. Nepocatych

Elon University

Department of Exercise Science

100 Campus Dr.

2525 CB

Elon, NC 27244

United States

E-mail: snepocatych@elon.edu

Word count: 2,946

Word count: 4259

Abstract word count: 211

Number of Tables: 3

2.1.1. Title

Title should be short and informative and the recommended length is no more than 20 words. The title should be in Title Case, written in uppercase and lowercase letters (initial uppercase for all words except articles, conjunctions, short prepositions no longer than four letters etc.) so that first letters of the words in the title are capitalized. Exceptions are words like: "and", "or", "between" etc. The word following a colon (:) or a hyphen (-) in the title is always capitalized.

2.1.2. Type of publication

Authors should suggest the type of their submission.

2.1.3. Running head

Short running title should not exceed 50 characters including spaces.

2.1.4. Authors

The form of an author's name is first name, middle initial(s), and last name. In one line list all authors with full names separated by a comma (and space). Avoid any abbreviations of academic or professional titles. If authors belong to different institutions, following a family name of the author there should be a number in superscript designating affiliation.

2.1.5. Affiliations

Affiliation consists of the name of an institution, department, city, country/territory (in this order) to which the author(s) belong and to which the presented / submitted work should be attributed. List all affiliations (each in a separate line) in the order corresponding to the list of authors. Affiliations must be written in English, so carefully check the official English translation of the names of institutions and departments.

Only if there is more than one affiliation, should a number be given to each affiliation in order of appearance. This number should be written in superscript at the beginning of the line, separated from corresponding affiliation with a space. This number should also be put after corresponding name of the author, in superscript with no space in between.

If an author belongs to more than one institution, all corresponding superscript digits, separated with a comma with no space in between, should be present behind the family name of this author.

In case all authors belong to the same institution affiliation numbering is not needed.

Whenever possible expand your authors' affiliations with departments, or some other, specific and lower levels of organization.

2.1.6. Corresponding author

Corresponding author's name with full postal address in English and e-mail address should appear, after the affiliations. It is preferred that submitted address is institutional and not private. Corresponding author's name should include only initials of the first and middle names separated by a full stop (and a space) and the last name. Postal address should be written in the following line in sentence case. Parts of the address should be separated by a comma instead of a line break. E-mail (if possible) should be placed in the line following the postal address. Author should clearly state whether or not the e-mail should be published.

2.1.7. Manuscript information

All authors are required to provide word count (excluding title page, abstract, tables/figures, figure legends, Acknowledgements, Conflict of Interest, and References), the Abstract word count, the number of Tables, and the number of Figures.

2.2. Abstract

The second page of the manuscripts should be the abstract and key words. It should be placed on second page of the manuscripts after the standard title written in upper and lower case letters, bold.

Since abstract is independent part of your paper, all abbreviations used in the abstract should also be explained in it. If an abbreviation is used, the term should always be first written in full with the abbreviation in parentheses immediately after it. Abstract should not have any special headings (e.g., Aim, Results…).

Authors should provide up to six key words that capture the main topics of the article. Terms from the Medical Subject Headings (MeSH) list of Index Medicus are recommended to be used.

Key words should be placed on the second page of the manuscript right below the abstract, written in italic. Separate each key word by a comma (and a space). Do not put a full stop after the last key word. *See* example:

Abstract

Results of the analysis of

Key words: *spatial memory, blind, transfer of learning, feedback*

2.3. Main Chapters

Starting from the third page of the manuscripts, it should be the main chapters. Depending on the type of publication main manuscript chapters may vary. The general outline is: Introduction, Methods, Results, Discussion, Acknowledgements (optional), Conflict of Interest (optional), and Title, Author's Affiliations, Abstract and Key words must be in English (for both each chosen language of full paper). However, this scheme may not be suitable for reviews or publications from some areas and authors should then adjust their chapters accordingly but use the general outline as much as possible.

2.3.1. Headings

Main chapter headings: written in bold and in Title Case. *See* example:

- ✓ **Methods**

Sub-headings: written in italic and in normal sentence case. Do not put a full stop or any other sign at the end of the title. Do not create more than one level of sub-heading. *See* example:

- ✓ *Table position of the research football team*

2.3.2 Ethics

When reporting experiments on human subjects, there must be a declaration of Ethics compliance. Inclusion of a statement such as follow in Methods section will be understood by the Editor as authors' affirmation of compliance: "This study was approved in advance by [name of committee and/or its institutional sponsor]. Each participant voluntarily provided written informed consent before participating." Authors that fail to submit an Ethics statement will be asked to resubmit the manuscripts, which may delay publication.

2.3.3 Statistics reporting

JASPE encourages authors to report precise p-values. When possible, quantify findings and present them with appropriate indicators of measurement error or uncertainty (such as confidence intervals). Use normal text (i.e., non-capitalized, non-italic) for statistical term "p".

2.3.4. 'Acknowledgements' and 'Conflict of Interest' (optional)

All contributors who do not meet the criteria for authorship should be listed in the 'Acknowledgements' section. If applicable, in 'Conflict of Interest' section, authors must clearly disclose any grants, financial or material supports, or any sort of technical assistances from an institution, organization, group or an individual that might be perceived as leading to a conflict of interest.

2.4. References

References should be placed on a new page after the standard title written in upper and lower case letters, bold.

All information needed for each type of must be present as specified in guidelines. Authors are solely responsible for accuracy of each reference. Use authoritative source for information such as Web of Science, Medline, or PubMed to check the validity of citations.

2.4.1. References style

JASPE adheres to the American Psychological Association 6th Edition reference style. Check "American Psychological Association. (2009). Concise rules of APA style. American Psychological Association." to ensure the manuscripts conform to this reference style. Authors using EndNote® to organize the references must convert the citations and bibliography to plain text before submission.

2.4.2. Examples for Reference citations

One work by one author
- ✓ In one study (Reilly, 1997), soccer players
- ✓ In the study by Reilly (1997), soccer players
- ✓ In 1997, Reilly's study of soccer players

Works by two authors
- ✓ Duffield and Marino (2007) studied
- ✓ In one study (Duffield & Marino, 2007), soccer players
- ✓ In 2007, Duffield and Marino's study of soccer players

Works by three to five authors: cite all the author names the first time the reference occurs and then subsequently include only the first author followed by et al.
- ✓ First citation: Bangsbo, Iaia, and Krustrup (2008) stated that
- ✓ Subséquent citation: Bangsbo et al. (2008) stated that

Works by six or more authors: cite only the name of the first author followed by et al. and the year
- ✓ Krustrup et al. (2003) studied
- ✓ In one study (Krustrup et al., 2003), soccer players

Two or more works in the same parenthetical citation: Citation of two or more works in the same parentheses should be listed in the order they appear in the reference list (i.e., alphabetically, then chronologically)
- ✓ Several studies (Bangsbo et al., 2008; Duffield & Marino, 2007; Reilly, 1997) suggest that

2.4.3. Examples for Reference list

Journal article (print):

Nepocatych, S., Balilionis, G., & O'Neal, E. K. (2017). Analysis of dietary intake and body composition of female athletes over a competitive season. *Montenegrin Journal of Sports Science and Medicine, 6*(2), 57-65. doi: 10.26773/mjssm.2017.09.008

Duffield, R., & Marino, F. E. (2007). Effects of pre-cooling procedures on intermittent-sprint exercise performance in warm conditions. *European Journal of Applied Physiology, 100*(6), 727-735. doi: 10.1007/s00421-007-0468-x

Krustrup, P., Mohr, M., Amstrup, T., Rysgaard, T., Johansen, J., Steensberg, A., Bangsbo, J. (2003). The yo-yo intermittent recovery test: physiological response, reliability, and validity. *Medicine and Science in Sports and Exercise, 35*(4), 697-705. doi: 10.1249/01.MSS.0000058441.94520.32

Journal article (online; electronic version of print source):

Williams, R. (2016). Krishna's Neglected Responsibilities: Religious devotion and social critique in eighteenth-century North India [Electronic version]. *Modern Asian Studies, 50*(5), 1403-1440. doi:10.1017/S0026749X14000444

Journal article (online; electronic only):

Chantavanich, S. (2003, October). Recent research on human trafficking. *Kyoto Review of Southeast Asia, 4*. Retrieved November 15, 2005, from http://kyotoreview.cseas.kyoto-u.ac.jp/issue/issue3/index.html

Conference paper:

Pasadilla, G. O., & Milo, M. (2005, June 27). *Effect of liberalization on banking competition*. Paper presented at the conference on Policies to Strengthen Productivity in the Philippines, Manila, Philippines. Retrieved August 23, 2006, from http://siteresources.worldbank.org/INTPHILIPPINES/Resources/Pasadilla.pdf

Encyclopedia entry (print, with author):

Pittau, J. (1983). Meiji constitution. In *Kodansha encyclopedia of Japan* (Vol. 2, pp. 1-3). Tokyo: Kodansha.

Encyclopedia entry (online, no author):

Ethnology. (2005, July). In *The Columbia encyclopedia* (6th ed.). New York: Columbia University Press. Retrieved November 21, 2005, from http://www.bartleby.com/65/et/ethnolog.html

Thesis and dissertation:

Pyun, D. Y. (2006). *The proposed model of attitude toward advertising through sport.* Unpublished Doctoral Dissertation. Tallahassee, FL: The Florida State University.

Book:
Borg, G. (1998). *Borg's perceived exertion and pain scales*: Human kinetics.

Chapter of a book:
Kellmann, M. (2012). Chapter 31-Overtraining and recovery: Chapter taken from Routledge Handbook of Applied Sport Psychology ISBN: 978-0-203-85104-3 *Routledge Online Studies on the Olympic and Paralympic Games* (Vol. 1, pp. 292-302).

Reference to an internet source:
Agency. (2007). Water for Health: Hydration Best Practice Toolkit for Hospitals and Healthcare. Retrieved 10/29, 2013, from www.rcn.org.uk/newsevents/hydration

2.5. Tables

All tables should be included in the main manuscript file, each on a separate page right after the Reference section.

Tables should be presented as standard MS Word tables.

Number (Arabic) tables consecutively in the order of their first citation in the text.

Tables and table headings should be completely intelligible without reference to the text. Give each column a short or abbreviated heading. Authors should place explanatory matter in footnotes, not in the heading. All abbreviations appearing in a table and not considered standard must be explained in a footnote of that table. Avoid any shading or coloring in your tables and be sure that each table is cited in the text.

If you use data from another published or unpublished source, it is the authors' responsibility to obtain permission and acknowledge them fully.

2.5.1. Table heading

Table heading should be written above the table, in Title Case, and without a full stop at the end of the heading. Do not use suffix letters (e.g., Table 1a, 1b, 1c); instead, combine the related tables. *See* example:

- ✓ **Table 1.** Repeated Sprint Time Following Ingestion of Carbohydrate-Electrolyte Beverage

2.5.2. Table sub-heading

All text appearing in tables should be written beginning only with first letter of the first word in all capitals, i.e., all words for variable names, column headings etc. in tables should start with the first letter in all capitals. Avoid any formatting (e.g., bold, italic, underline) in tables.

2.5.3. Table footnotes

Table footnotes should be written below the table.

General notes explain, qualify or provide information about the table as a whole. Put explanations of abbreviations, symbols, etc. here. General notes are designated by the word *Note* (italicized) followed by a period.

- ✓ *Note.* CI: confidence interval; Con: control group; CE: carbohydrate-electrolyte group.

Specific notes explain, qualify or provide information about a particular column, row, or individual entry. To indicate specific notes, use superscript lowercase letters (e.g. $^{a, b, c}$), and order the superscripts from left to right, top to bottom. Each table's first footnote must be the superscript ^{a}.

- ✓ ^{a}One participant was diagnosed with heat illness and n = 19.^{b}n =20.

Probability notes provide the reader with the results of the texts for statistical significance. Probability notes must be indicated with consecutive use of the following symbols: * † ‡ § ¶ || etc.

- ✓ *P<0.05,†p<0.01.

2.5.4. Table citation

In the text, tables should be cited as full words. *See* example:

- ✓ Table 1 (first letter in all capitals and no full stop)
- ✓ ...as shown in Tables 1 and 3. (citing more tables at once)
- ✓ ...result has shown (Tables 1-3) that... (citing more tables at once)
- ✓ ....in our results (Tables 1, 2 and 5)... (citing more tables at once)

2.6. Figures

On the last separate page of the main manuscript file, authors should place the legends of all the figures submitted separately.

All graphic materials should be of sufficient quality for print with a minimum resolution of 600 dpi. JASPE prefers TIFF, EPS and PNG formats.

If a figure has been published previously, acknowledge the original source and submit a written permission from the copyright holder to reproduce the material. Permission is required irrespective of authorship or publisher except for documents in the public domain. If photographs of people are used, either the subjects must not be identifiable or their pictures must be accompanied by written permission to use the photograph whenever possible permission for publication should be obtained.

Figures and figure legends should be completely intelligible without reference to the text.

The price of printing in color is 50 EUR per page as printed in an issue of JASPE.

2.6.1. Figure legends

Figures should not contain footnotes. All information, including explanations of abbreviations must be present in figure legends. Figure legends should be written bellow the figure, in sentence case. *See* example:

- ✓ **Figure 1.** Changes in accuracy of instep football kick measured before and after fatigued. SR – resting state, SF – state of fatigue, *p>0.01, †p>0.05.

2.6.2. Figure citation

All graphic materials should be referred to as Figures in the text. Figures are cited in the text as full words. *See* example:

- ✓ Figure 1
  - × figure 1
  - × Figure 1.
  - ✓ ….exhibit greater variance than the year before (Figure 2). Therefore…
  - ✓ ….as shown in Figures 1 and 3. (citing more figures at once)
  - ✓ ….result has shown (Figures 1-3) that... (citing more figures at once)
  - ✓ ….in our results (Figures 1, 2 and 5)... (citing more figures at once)

2.6.3. Sub-figures

If there is a figure divided in several sub-figures, each sub-figure should be marked with a small letter, starting with a, b, c etc. The letter should be marked for each subfigure in a logical and consistent way. *See* example:

- ✓ Figure 1a
- ✓ …in Figures 1a and b we can…
- ✓ …data represent (Figures 1a-d)…

2.7. Scientific Terminology

All units of measures should conform to the International System of Units (SI).

Measurements of length, height, weight, and volume should be reported in metric units (meter, kilogram, or liter) or their decimal multiples.

Decimal places in English language are separated with a full stop and not with a comma. Thousands are separated with a comma.

Percentage	Degrees	All other units of measure	Ratios	Decimal numbers
✓ 10%	✓ 10º	✓ 10 kg	✓ 12:2	✓ 0.056
× 10 %	× 10 º	× 10kg	× 12 : 2	× .056

Signs should be placed immediately preceding the relevant number.		
✓ 45±3.4	✓ p<0.01	✓ males >30 years of age
× 45 ± 3.4	× p < 0.01	× males > 30 years of age

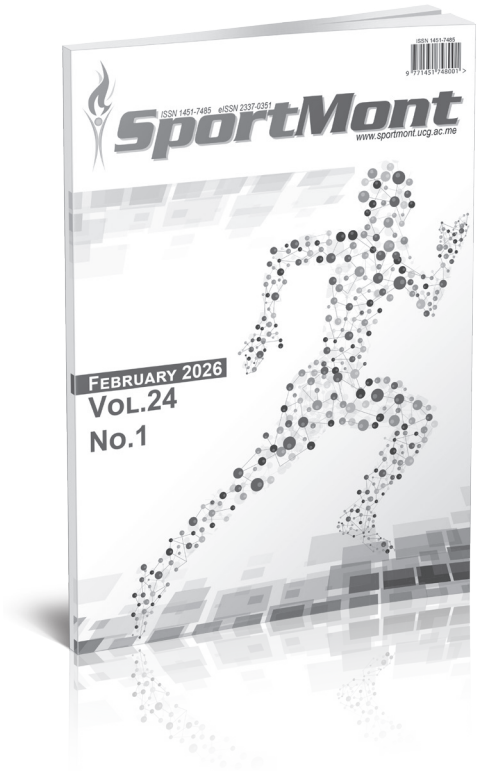
2.8. Latin Names

Latin names of species, families etc. should be written in italics (even in titles). If you mention Latin names in your abstract they should be written in non-italic since the rest of the text in abstract is in italic. The first time the name of a species appears in the text both genus and species must be present; later on in the text it is possible to use genus abbreviations. *See* example:

- ✓ First time appearing: *musculus biceps brachii*

Abbreviated: *m. biceps brachii*

ISSN 1451-7485 eISSN 2337-0351
SportMont
www.sportmont.ucg.ac.me



ISSN 1451-7485

Sport Mont Journal (SMJ) is a print (ISSN 1451-7485) and electronic scientific journal (eISSN 2337-0351) aims to present easy access to the scientific knowledge for sport-conscious individuals using contemporary methods. The purpose is to minimize the problems like the delays in publishing process of the articles or to acquire previous issues by drawing advantage from electronic medium. Hence, it provides:

- Open-access and freely accessible online;
- Fast publication time;
- Peer review by expert, practicing researchers;
- Post-publication tools to indicate quality and impact;
- Community-based dialogue on articles;
- Worldwide media coverage.

SMJ is published three times a year, in February, June and October of each year. SMJ publishes original scientific papers, review papers, editorials, short reports, peer review - fair review, as well as invited papers and award papers in the fields of Sports Science and Medicine, as well as it can function as an open discussion forum on significant issues of current interest.

SMJ covers all aspects of sports science and medicine; all clinical aspects of exercise, health, and sport; exercise physiology and biophysical investigation of sports performance; sport biomechanics; sports nutrition; rehabilitation, physiotherapy; sports psychology; sport pedagogy, sport history, sport philosophy, sport sociology, sport management; and all aspects of scientific support of the sports coaches from the natural, social and humanistic side.

Prospective authors should submit manuscripts for consideration in Microsoft Word-compatible format. For more complete descriptions and submission instructions, please access the Guidelines for Authors pages at the SMJ website: http://www.sportmont.ucg.ac.me/?sekcija=page&p=51. Contributors are urged to read SMJ's guidelines for the authors carefully before submitting manuscripts. Manuscripts submissions should be sent in electronic format to sportmont@ucg.ac.me or contact following Editors:

Dusko BJELICA, *Editor-in Chief – sportmont@t-com.me*
Zoran MILOSEVIC, *Editor-in Chief – zoranais@eunet.rs*
Borko KATANIC, *Managing Editor – borkokatanic@gmail.com*
Nedim COVIC, *Managing Editor – nedimcovic@gmail.com*

Publication date: Autumn issue – October 2025
Winter issue – February 2027
Summer issue – June 2026

MONTENEGRIN SPORTS ACADEMY

Founded in 2003 in Podgorica (Montenegro), the Montenegrin Sports Academy (MSA) is a sports scientific society dedicated to the collection, generation and dissemination of scientific knowledge at the Montenegrin level and beyond.

The Montenegrin Sports Academy (MSA) is the leading association of sports scientists at the Montenegrin level, which maintains extensive co-operation with the corresponding associations from abroad. The purpose of the MSA is the promotion of science and research, with special attention to sports science across Montenegro and beyond. Its topics include motivation, attitudes, values and responses, adaptation, performance and health aspects of people engaged in physical activity and the relation of physical activity and lifestyle to health, prevention and aging. These topics are investigated on an interdisciplinary basis and they bring together scientists from all areas of sports science, such as adapted physical activity, biochemistry, biomechanics, chronic disease and exercise, coaching and performance, doping, education, engineering and technology, environmental physiology, ethics, exercise and health, exercise, lifestyle and fitness, gender in sports, growth and development, human performance and aging, management and sports law, molecular biology and genetics, motor control and learning, muscle mechanics and neuromuscular control, muscle metabolism and hemodynamics, nutrition and exercise, overtraining, physiology, physiotherapy, rehabilitation, sports history, sports medicine, sports pedagogy, sports philosophy, sports psychology, sports sociology, training and testing.

The MSA is a non-profit organization. It supports Montenegrin institutions, such as the Ministry of Education and Sports, the Ministry of Science and the Montenegrin Olympic Committee, by offering scientific advice and assistance for carrying out coordinated national and European research projects defined by these bodies. In addition, the MSA serves as the most important Montenegrin and regional network of sports scientists from all relevant subdisciplines.

The main scientific event organized by the Montenegrin Sports Academy (MSA) is the annual conference held in the first week of April.

Annual conferences have been organized since the inauguration of the MSA in 2003. Today the MSA conference ranks among the leading sports scientific congresses in the Western Balkans. The conference comprises a range of invited lecturers, oral and poster presentations from multi- and mono-disciplinary areas, as well as various types of workshops. The MSA conference is attended by national, regional and international sports scientists with academic careers. The MSA conference now welcomes up to 200 participants from all over the world.

It is our great pleasure to announce the upcoming 25th International Conference of Montenegrin Sports Academy "Sports Science, Medicine & Health - Innovations, Achievements, Synergy and Challenges A Bridge to the Future of Excellence in Sports" to be held in Podgorica, Montenegro, from 24 to 26 September, 2026. It is planned to be once again organized by the Montenegrin Sports Academy, in cooperation with the Faculty of Sport and Physical Education, University of Montenegro and other international partner institutions (specified in the partner section).

The conference is focused on very current topics from all areas of sports science and sports medicine including physiology and sports medicine, social sciences and humanities, biomechanics and neuromuscular (see Abstract Submission page for more information).

We do believe that the topics offered to our conference participants will serve as a useful forum for the presentation of the latest research, as well as both for the theoretical and applied insight into the field of sports science and sports medicine disciplines.

USEFUL CONTACTS

Editorial enquiries and journal proposals:
Dusko Bjelica
Damir Sekulic
Editors-in-Chief
Email: **damirsekulic.mjssm@gmail.com**

Selcuk Akpinar
Executive Editor
Email: **office@mjssm.me**

Marketing enquiries:
Fidanka Vasileva
Marketing Manager
Email: **damirsekulic.mjssm@gmail.com**

Sports Science and Medicine Journals

from Montenegrin Sports Academy

We have expanded the quality of our journals considerably over the past years and can now claim to be the market leader in terms of breadth of coverage.

As we continue to increase the quality of our publications across the field, we hope that you will continue to regard MSA journals as authoritative and stimulating sources for your research. We would be delighted to receive your comments and suggestions, mostly due to the reason your proposals are always welcome.

Look Inside!

Sport Mont Journal

Editors-in-Chief: **Dusko Bjelica**, Montenegro; **Zoran Milosevic**, Serbia
Managing Editor: **Borko Katanic**, Montenegro; **Nedim Covic**, Bosnia and Herzegovina

Volume 24, 2026, 3 issues per year; Print ISSN: 1451-7485, Online ISSN: 2337-0351

Sport Mont Journal is a scientific journal that provides: Open-access and freely accessible online; Fast publication time; Peer review by expert, practicing researchers; Post-publication tools to indicate quality and impact; Community-based dialogue on articles; Worldwide media coverage. SMJ is published three times a year, in February, June and October of each year. SMJ publishes original scientific papers, review papers, editorials, short reports, peer review - fair review, as well as invited papers and award papers in the fields of Sports Science and Medicine, as well as it can function as an open discussion forum on significant issues of current interest.

www.sportmont.ucg.ac.me

Montenegrin Journal of Sports Science and Medicine

Editors-in-Chief: **Dusko Bjelica**, Montenegro; **Damir Sekulic**, Croatia
Executive Editor: **Selcuk Akpinar**, Turkey
Associate Editors: **Mehmet Uygur**, USA; **Catalina Casaru**, USA; and **Predrag Bozic**, Serbia

Volume 15, 2026, 2 issues per year; Print ISSN: 1800-8755, Online ISSN: 1800-8763

Montenegrin Journal of Sports Science and Medicine (MJSSM) is published biannually, in September and March of each year. MJSSM publishes original scientific papers, review papers, editorials, short reports, peer review - fair review, as well as invited papers and award papers in the fields of Sports Science and Medicine, as well as it can function as an open discussion forum on significant issues of current interest. MJSSM covers all aspects of sports science and medicine; all clinical aspects of exercise, health, and sport; exercise physiology and biophysical investigation of sports performance; sport biomechanics; sports nutrition; rehabilitation, physiotherapy; sports psychology; sport pedagogy, sport history, sport philosophy, sport sociology, sport management; and all aspects of scientific support of the sports coaches from the natural, social and humanistic side.

www.mjssm.me

CRNOGORSKI OLIMPIJSKI KOMITET
MONTENEGRIN OLYMPIC COMMITTEE

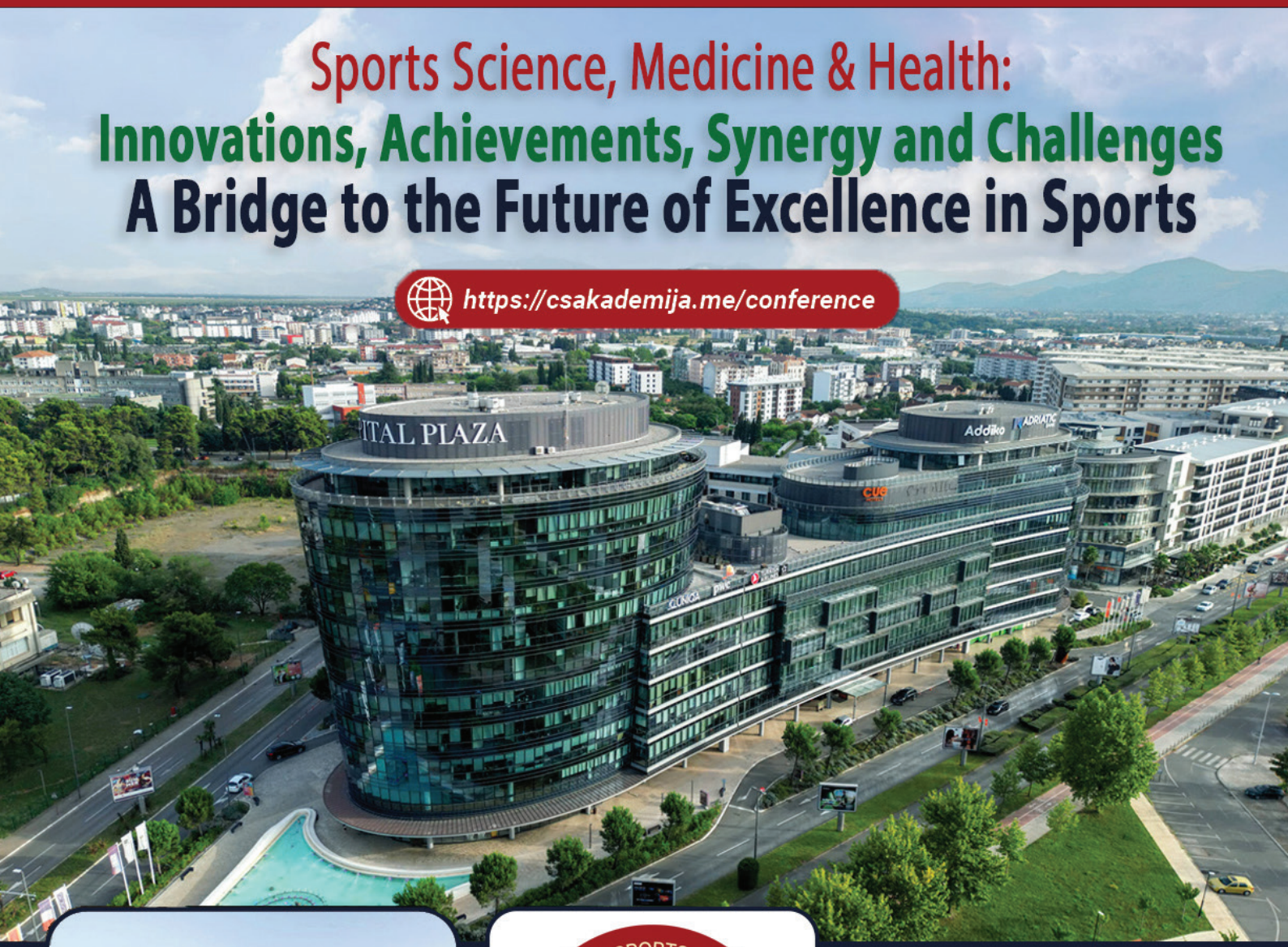
CIP – Каталогизација у публикацији
Национална библиотека Црне Горе, Цетиње

ISSN 2536-569X
COBISS.CG-ID 33826832

International Conference of MontenegroSport

Sports Science, Medicine & Health:
Innovations, Achievements, Synergy and Challenges
A Bridge to the Future of Excellence in Sports

https://csakademija.me/conference



CRNOGORSKA SPORTSKA AKADEMIJA
MONTENEGRIN SPORTS ACADEMY

24th–26th September 2026

Crowne Plaza
PODGORICA, MONTENEGRO

CRNOGORSKI OLIMPIJSKI KOMITET
MONTENEGRIN OLYMPIC COMMITTEE

FIEPS

EUROPEAN COLLEGE of SPORT SCIENCE

FPMOZ
Fakultet prirodoslovno-matematičkih i odgojnih znanosti Sveučilište u Mostaru

UNIVERSITY OF LJUBLJANA | FŠ Faculty of Sport