

前言

本刊主要收录 Web of Science 核心合集数据库有关体育教育、奥林匹克教育、体育人工智能、体医融合、文化与新闻传播、冰雪运动等领域的最新研究成果。

Web of Science 核心合集包括 Science Citation Index Expanded (SCIE)、社会科学引文索引 (SSCI)、艺术和人文引文索引 (AHCI)、Emerging Sources Citation Index (ESCI)、Conference Proceedings Citation Index (CPCI)、Book Citation Index (BKCI) 等，是科学及学术研究的全球原创引证索引。其涵盖超过 250 个自然科学、社会科学、艺术和人文学科。

本刊旨在利用 Web of Science 核心合集平台为广大师生提供有关目前热点的最新研究内容。检索导出的数据采用书目共现分析系统 (Bicomb V2021) 对文献信息进行提取，包括期刊、关键词、标题、发文年份等，相同含义的字段去重且批量合并，同时去除没有实质意义的字段，对所提取的字段进行频次统计，形成高频矩阵，并使用社会网络分析软件 Ucinet 绘制成知识图谱，进行共词聚类分析。

本期选录体育教育方面的文献 13 篇，奥林匹克教育方面的文献 9 篇，体育人工智能方面的文献 13 篇，体医融合方面的文献 11 篇，文化与新闻传播的文献 10 篇，冰雪运动方面的文献 10 篇。

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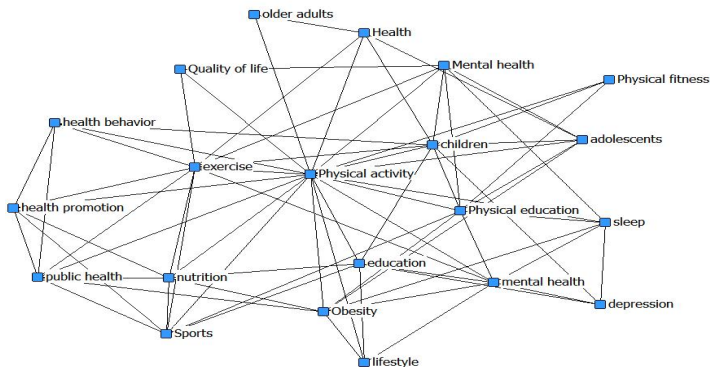
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体育教育

本期体育教育学术研究共检索到英文相关文献 487 篇，研究热点主要集中在青少年的体育教育与体育活动、体育课程对小学生体质和持续注意力的影响、体育教学法对中高强度身体活动及心肺健康的影响、智能体育教学方法优化、体育课程实施水平评估及影响因素、基于人工智能的体育教学有效性评估与反馈等。检索结果：1) 关键词共词分析。提取关键词 2319 个，经过数据清洗后关键词有 1726 个，词频为 6 及以上的关键词有 21 个，累计百分比为 13.24%，高频关键词有体育活动、体育教育、儿童、锻炼、老年人、精神健康、久坐、练习、青少年、教育、生活方式等，生成可视化知识图谱（见下图）。2) 来源期刊分析。涉及期刊 256 种，其中载文 4 篇及以上的期刊有 21 种，累计百分比为 40.66%，刊载体育教育相关内容前三位的期刊分别为：BMC PUBLIC HEALTH（JCR 学科分区 Q1），FRONTIERS IN PUBLIC HEALTH（JCR 学科分区 Q1，Q1），PLOS ONE（JCR 学科分区 Q2）。3) 交叉学科分析。引用文献总计 24316 篇，最多的频次为 25 次，排名前三位的文献分别为 *World Health Organization 2020 guidelines on physical activity and sedentary behavior*、*Global trends in insufficient physical activity among adolescents: a pooled analysis of 298 population-based surveys with 1.6 million participants*、*International physical activity questionnaire:: 12-country reliability and validity*。4) 学术关注度分析。文献级别用量最多的是 49 次，排名前三位的文献分别为 *Childhood predictors of high school sport participation and effects of participation on young adult activity and mental health*、*Exploring digital health: a qualitative study on adults' experiences with health apps and wearables*、*Association of tea consumption with all-cause/cardiovascular disease mortality in the chronic kidney disease population: an assessment of participation in the national cohort*。



Grogan M, MacPhail A, Costa J, et al. A Content Map Analysis of the National Policy Landscape in Physical Education, Physical Activity and Youth Sport in Ireland[J]. SPORT EDUCATION AND SOCIETY, NOV 2025.

ABSTRACT

Mapping of national and international policy landscapes is widely acknowledged as imperative in understanding the breadth, depth and extent of existing policies. The aim of the current study was to conduct a content map analysis of the national policy landscape in physical education, physical activity and youth sport in Ireland. A three-step systematic approach was used to achieve this aim that included: (a) Policymaker identification; (b) Policy identification; (c) Alignment of identified policies with the domains of physical education, physical activity and youth sport. Deductive content analysis was used to illustrate policy documents alignment across the three domains of physical education, physical activity and youth sport. In parallel, utilising an inductive approach, a matrix was constructed in which each policy document was categorised according to whether it acknowledged or addressed the three aforementioned domains. Policymakers were classified into three categories, namely (a) Governmental Departments, (b) State entities and (c) National Governing Bodies (NGBs). In total, 18 policymakers issued 82 active policy documents pertinent to physical education, physical activity and youth sport in Ireland. The analysis of domain alignment revealed that while some policymakers acknowledged multiple domains, most prioritised only one. The crowded policy landscape surrounding physical education, physical activity and youth sport in Ireland highlights potential overlaps, inefficiencies and gaps in implementation. While there are significant links between physical education and other domains, greater cross-sectoral collaboration and policy alignment are needed to enhance coherence and impact. Addressing discrepancies in policy acknowledgment can ensure a more integrated and aligned approach to physical education, physical activity and youth sport.

Biver S, Loux T, Shacham E. Association Between High School Physical Education and Physical Activity in Missouri Students[J]. PHYSICAL EDUCATION AND SPORT PEDAGOGY, DEC 2025.

ABSTRACT

BackgroundThe United States Centers for Disease Control and Prevention (CDC) recommends that adolescents engage in 60 min of physical activity (PA) daily. However, the average PA levels of adolescents are far below those recommendations. Physical education (PE) develops the knowledge, skills, and attitudes necessary for a healthy lifestyle and is recognized by the Community Preventive Services Task Force as an evidence-based strategy to increase PA among adolescents. However, few states mandate the recommended PE class time, and policies vary widely between states. Missouri's PE policies are below the national recommendations. Analyzing Missouri specific data will be insightful in guiding state specific policies.
PurposeTo determine if PE attendance in Missouri high schools is associated with PA levels, and if sport participation moderates the relationship between PE attendance and PA levels.
MethodsThis study used data from 2021 and 2023 Youth Risk Behavior Surveillance System (YRBSS) including items on self-reported PE attendance, PA, and sport participation. Two ordinal regression models were created; the first explored the association between participation in PE and PA. A second model built on the first by adding the interaction effect between PE and sport participation to determine if sport participation moderates the association between PE and PA.
FindingsA complete case analysis resulted in a total sample of 1424 high school students from Missouri. The odds of being more physically active increased as additional days of PE attendance were reported. The second regression model shows similar results as the first while identifying a diminishing return on PA levels for those who participate in both PE and sports. This analysis identifies a strong association between PE participation and increased levels of PA among Missouri high school students, particularly for students who do not

play sports and are at higher risk of lower levels of PA. Conclusion This study supports the need for high school PE policies to be aligned with the national recommendation of required daily PE to provide a structural intervention that improves the levels of PA engagement and health of our young people. Impact Statement This analysis provides Missouri-specific evidence that PE participation is associated with higher PA levels among high school students, especially those who do not play sports. These findings strengthen the evidence for aligning Missouri's PE policies with national recommendations and highlights PE as a key strategy for promoting structured PA opportunities for youth.

Wang Y, Wang QY, Dong XX, et al. Effects of 10-Week Modified Badminton Curriculum on Physical Fitness and Sustained Attention in Elementary School Children[J]. SCIENTIFIC REPORTS, DEC 13 2025, vol.15, issue 1.

ABSTRACT

School Physical Education (PE) serves as an effective platform for promoting physical activity among elementary school students, playing a crucial role in enhancing their physical fitness and sustained attention through organized and disciplined PE curricula. However, traditional PE often emphasizes single skill training and physical exercises, which presents certain limitations in fostering both physical fitness and sustained attention. To address these limitations, this study aims to design a modified badminton curriculum tailored to the unique characteristics of the sport. An intervention experiment was conducted with 106 fifth-grade students over a 10-week period. The experimental group participated in the modified badminton curriculum, while the control group followed the traditional badminton curriculum. Both groups received the intervention three times per week, with each session lasting 40 minutes. Among them, the experimental group consisted of 53 participants, and the control group also included 53 participants. As a result, the final analytic sample comprised 86 participants, including 45 in the experimental group

(mean age = 11.24 years, SD = 0.44) and 41 in the control group (mean age = 11.32 years, SD =0.47). Results from repeated measures analysis of variance indicated that the experimental group exhibited greater improvements in speed fitness, endurance, and Reaction Time Variability (RTV), outperforming the control group ($p < 0.05$). No significant differences were found in flexibility, coordination, strength, No-go accuracy, Go average reaction time, or response accuracy. Therefore, future PE should adopt scientifically grounded designs and diverse arrangements to effectively stimulate students' participation interest and psychological motivation, thereby promoting the coordinated development of physical fitness and sustained attention.

Tran THT, Lutz B, Jia H, et al. Technology-enhanced Quality Physical Education Impacting Moderate-to-Vigorous Physical Activity and Cardiorespiratory Fitness[J]. MEDICINE & SCIENCE IN SPORTS & EXERCISE, OCT 2025, vol.57, issue 10s, pp.283-284.

ABSTRACT

The article focuses on the effectiveness of a 12-week technology-enhanced quality physical education (QPE) intervention, termed Smart-QPE, in increasing moderate-to-vigorous physical activity (MVPA) and improving cardiorespiratory fitness (CRF) among children. The study involved 335 fourth- and sixth-grade students who participated in QPE lessons where their MVPA was tracked using heart rate sensors and tablet software. Results indicated that students engaged in MVPA for an average of 58.06% of PE class time, significantly improving their CRF as measured by the Progressive Aerobic Cardiovascular Endurance Respiratory (PACER) test. The findings suggest that Smart-QPE is an effective approach to enhance children's physical fitness and overall health.

Liu X, Sang XY, Huo GQ, et al. Optimization of Intelligent Physical Education Teaching Method Based on Fuzzy Logic and Virtual Reality[J]. DISCOVER COMPUTING, DEC 2025, vol. 28, issue 1.

ABSTRACT

Traditional physical education classes frequently face challenges with student participation, resource availability, and individualized instruction, despite the importance of physical education to overall health, well-being, and physical fitness. Utilizing Virtual Reality (VR)-augmented settings, Salp Swarm Optimization-Seq2Seq Neural Networks (SSO-NN), and fuzzy logic adaptation, this research presents a novel automated human activity detection system designed to address the issues presented. To obtain spectral density, skewness, and kurtosis, multivariate time-series motion data from wearable sensors, such as accelerometers, are studied. Salp Swarm Optimization selects the most informative temporal variables and models them with a Sequence-to-Sequence neural network to recognize human activity sequences of unknown length. Fuzzy logic enables adjusting difficulty and tailoring instruction based on the student's level of performance and involvement. It has been demonstrated using real-world physical activity datasets that the proposed system can recognize complex movements with high accuracy and provides customizable, adaptive teaching. This effort achieved primary improvements in virtual reality (VR) immersion, enhanced activity recognition, and fuzzy reasoning. These innovations enhance student engagement and enable the customization of physical education curricula, thereby improving the overall learning experience.

Liu H, Bin AmriS, Ayub AFB. Assessment of the Implementation Level of the Physical Education Program in Junior High Schools in Huaibei City, China, and Analysis of Influencing Factors[J]. BMC PUBLIC HEALTH, NOV 21 2025, vol.25, issue 1.

ABSTRACT

Background The school physical education program is an important factor in improving students' physical fitness. In China, secondary school students' physical fitness is facing a lot of problems, and in order to improve students' physical fitness, the quality of the implementation of the physical education program by the school should be ensured, so it is necessary to investigate the current status of the implementation of the physical education program by junior high school schools in China, and to analyze the dimensions in which schools with high levels of implementation are better than others, so as to provide a reference for other levels of implementation to better improve the physical fitness of students. **Methods** A questionnaire was used to assess the physical education implementation levels of 47 schools in the city, covering 10 dimensions. ANOVA was used to compare the differences in the dimensions among schools of different levels, and multiple linear regression analysis was used to explore the influence of each dimension on the implementation level. **Results** The implementation level of physical education in junior high schools in the city was characterized by a distribution with more in the middle and less at the ends, and the high-level schools were significantly better than the low-level schools in several dimensions. Regression analysis showed that only campus physical activities ($\beta = 0.058$, $t = 2.616$, $p = 0.013$) and teacher team ($\beta = 0.080$, $t = 3.331$, $p = 0.002$) had a significant positive predictive effect on the implementation level. **Conclusion** campus physical activities and teacher team development are the key players in improving the implementation level of physical education. It is recommended that education departments prioritize the strengthening of these two aspects, while paying attention to inter-school differences and

promoting the balanced development of regional physical education.

Goldstein O, Lefèvre L, Derigny T, et al. Understanding the Differences in Boys' and Girls' Involvement in Physical Education in French High School Context: An Ecological Approach[J]. JOURNAL OF SPORTS SCIENCES, NOV 2025.

ABSTRACT

The World Health Organization advises that adolescents engage in at least 60 minutes of moderate to vigorous physical activity daily. However, a significant proportion of adolescents do not meet this recommendation, with a notable gender gap. Specifically, 92% of girls fall short of this target, compared to 82% of boys. Physical education programs often exacerbate these inequalities. This study aims to investigate, within the ecological framework, the conditions that exacerbate or mitigate gender differences in physical activity engagement during physical education classes. The study is based on a mixed methodology, combining quantitative measures (accelerometers, questionnaires) and qualitative measures (focus groups). Results showed that the odds of girls engaging in high levels of MVPA were substantially lower than those of boys (OR approximate to 0.65), particularly during performance-oriented and opposition activities. Gender disparities were also more pronounced in advantaged and urban schools, whereas rural and lower-SPI contexts showed smaller gaps. Qualitative data revealed that girls often experience social discomfort and judgement, particularly from boys, which undermines their participation. These findings emphasise the importance of rethinking PE practices through an ecological lens by considering the interplay between activity type, school context and social dynamics, to foster more inclusive engagement for all students.

Flores-Cidoncha A, Moreno A, Gil-Arias A, et al. Do Pedagogical Models Alone Have the Same Impact as Integrating Need-Supportive Strategies? An Intervention Study in Secondary Physical Education[J]. EUROPEAN PHYSICAL EDUCATION REVIEW, NOV 2025.

ABSTRACT

Interventions based on pedagogical models have been shown to improve various motivational variables in physical education (PE) students, but to date, need-supportive strategies grounded in self-determination theory (SDT) have not been implemented alongside these models to explore their potential added benefits. This study examines the effect of an educational project based on hybridizing the pedagogical models Sport Education (SE) and Teaching Games for Understanding (TGfU) with need-supportive strategies on PE students. The quasi-experimental design included 151 secondary PE students (Mage = 13.75, SDage = 0.81, 71 girls and 80 boys), divided into a control group (four classes; n = 74, 33 girls and 41 boys), receiving the SE/TGfU hybridization alone, and an experimental group (four classes; n = 77, 38 girls and 39 boys), receiving the SE/TGfU hybridization alongside need-supportive strategies. These strategies focused on fostering autonomy, competence, relatedness, and novelty. The intervention, conducted over 11 weeks, included 22 PE lessons. Repeated measures multivariate analysis of covariance assessed effects on motivational processes (need support/thwarting, need satisfaction/frustration, and types of motivation), and cognitive (perceived learning), behavioral (engagement and physical activity intentions), and affective (self-esteem) outcomes. Both groups improved significantly in need support, need satisfaction, perceived learning, and reduced need frustration. Moreover, the experimental group showed greater increases in autonomous motivation, emotional engagement, self-esteem, and physical activity intentions, alongside larger decreases in need frustration and amotivation. The combined intervention generated additional benefits compared to the exclusive use of the SE/TGfU hybridization, suggesting that

integrating need-supportive strategies can enhance students' educational outcomes in PE.

Han YK, Zhang ML, Ji LF, et al. Can Feedback Promote Motor Skill Acquisition in Physical Education? An Updated Trial Sequential Meta-Analysis[J]. JOURNAL OF TEACHING IN PHYSICAL EDUCATION, OCT 2025.

ABSTRACT

Purpose: This study aims to clarify the effectiveness of feedback in promoting motor skill acquisition among students in physical education. Method: A comprehensive search of Scopus, Web of Science, and EBSCOHost databases was conducted through August 2024. Risk of bias was assessed using the Cochrane tool, and data analysis was performed with Review Manager 5.4 and Trial Sequential Analysis software. Results: The meta-analysis of 20 studies (N = 1,162) found that feedback significantly improved motor skill acquisition in physical education ($Z = 5.63$; $p < .01$; standardized mean differences = 0.95; 95% confidence interval [0.62, 1.28]), including complex ($Z = 3.68$; $p < .01$; standardized mean differences = 0.82; 95% confidence interval [0.38, 1.25]) and simple motor skills ($Z = 5.14$; $p < .01$; standardized mean differences = 0.83; 95% confidence interval [0.51, 1.15]). However, trial sequential analysis suggested potential false positives, as the Z curve crossed only the traditional boundary. Conclusion: Although feedback enhances motor skill learning in physical education, the evidence is not yet conclusive, necessitating further research to substantiate these findings.

Leukel C, Neumann M, Hertel S, et al. The Impact of Content Knowledge on Micro- and Macroadaptive Teaching and Children's Learning in Primary Physical Education[J]. JOURNAL OF TEACHING IN PHYSICAL EDUCATION, NOV 2025.

ABSTRACT

Purpose: This study explored how content knowledge (CK) affects both micro- and macroadaptive teaching, with a focus on microadaptivity, in fourth-grade physical education classes. Methods: In a pre-post design, two female preservice physical education teachers (PSTs) participated in a workshop to enhance their CK for teaching the squat vault (gymnastics) and "moving to get open" (basketball). Microadaptive teaching was assessed through PST responses, task instructions, and student performance; macroadaptivity was analyzed via lesson plans. Results: After the workshop, PSTs identified errors more accurately. The proportion of task instructions addressing student errors increased, and student performance improved in both skills. Lesson plans reflected higher quality content development. Conclusion: CK played a vital role in improving both microand macroadaptive teaching. In particular, CK helped PSTs respond more effectively to student needs during instruction.

Alfrey L, Young L. Student Voice, Expansive Learning and Transformative Agency: An Examination of the Transformation of Fitness Testing Pedagogies in Health and Physical Education[J]. SPORT EDUCATION AND SOCIETY, DEC 2025.

ABSTRACT

Fitness testing has been identified as a contentious feature of Health and Physical Education (HPE) for over three decades, but little research has explored how this contention is navigated and responded to by teachers and students in schools. This paper draws on the concepts of expansive learning [Engestr & ouml;m, Y., &

Sannino, A. (2010). Studies of expansive learning: Foundations, findings and future challenges. *Educational Research Review*, 5(1), 1-24. <https://doi.org/10.1016/j.edurev.2009.12.002>] and transformative agency [Haapasaari, A., Engestr & om; m, Y., & Kerosuo, H. (2016). The emergence of learner's transformative agency in a change laboratory intervention. *Journal of Education and Work*, 29(2), 232-262.<https://doi.org/10.1080/13639080.2014.900168>] to examine how a process of transforming fitness testing pedagogies (FTPs) impacted students (n = 21) in one Australian Secondary school. Data from the final stage of a three-stage research project (2021-2023) are shared and analysed. The data consisted of interview transcripts, annotated self-portraits (drawings) produced by the students during the focus groups and field notes. Reflexive thematic analysis was used to guide the analysis. Findings suggest that the concepts of expansive learning and transformative agency can guide pedagogical transformation and, in turn, enhance specific forms of student agency in HPE. Whilst this research demonstrated some utility of transformative agency, it is important to acknowledge that current conceptualisations do not necessarily allow for a grappling of system-level complexities.

Fu W, Fang WZ, Huang JH, et al. Skeleton-Based Action Quality Assessment with Anomaly-Aware DTW Optimization for Intelligent Sports Education[J]. SENSORS, NOV 24 2025, vol.25, issue 23.

ABSTRACT

In intelligent sports education, current action quality assessment (AQA) methods face significant limitations: regression-based methods are heavily dependent on high-quality annotated data, while unsupervised methods lack sufficient accuracy and degrade performance when handling long-duration sequences. To address these challenges, this paper introduces a novel indirect scoring method integrating action anomaly detection with a Quick Action Quality Assessment (QAQA) algorithm. In

this method, the proposed anomaly detection module dynamically adjusts action quality scores by identifying and analyzing acceleration outliers between frames, effectively improving the robustness and accuracy of sports AQA. Moreover, the QAQA algorithm utilizes a multi-resolution approach, including coarsening, projection, and refinement, to significantly reduce computational complexity to $O(n)$, alleviating the computational burden typically associated with long sequence analyses. Experimental results demonstrate that our method outperforms traditional methods in execution efficiency and scoring accuracy. The proposed system improves algorithmic performance and effectively contributes to intelligent sports training and education.

Wang J, Chen Y, Li, Y. Evaluation and Feedback System for Physical Education Teaching Effectiveness Based on Artificial Intelligence[J]. INTERNATIONAL JOURNAL OF COMPUTATIONAL INTELLIGENCE SYSTEMS, NOV 17 2025, vol.18, issue 1.

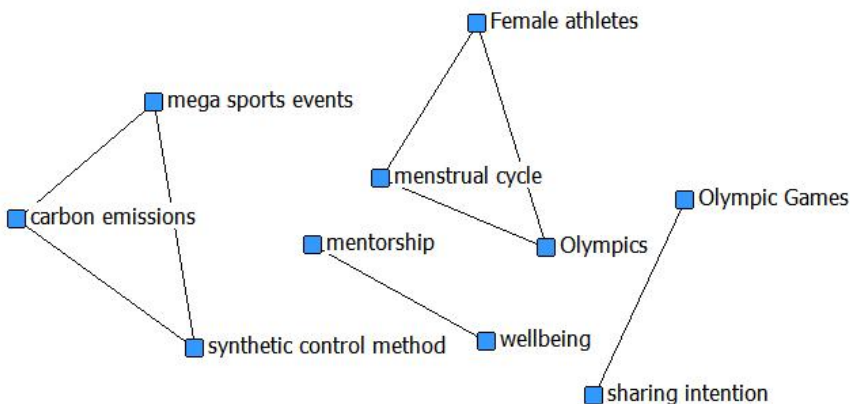
ABSTRACT

This study proposes a Feedback Evaluation System using Knowledge Transfer Learning (FES-KTL) to enhance the effectiveness of physical education teaching by systematically analyzing student feedback. The primary objective is to improve performance-centric teaching strategies through automated evaluation and classification of feedback into constructive or modifiable categories. The proposed method employs a knowledge transfer learning framework to align historical performance data with current feedback, iteratively optimizing feature relevance and classification accuracy. The model incorporates external performance metrics and training mode data to refine the classification process and adaptively learn from evolving feedback patterns. Experimental results demonstrate that FES-KTL significantly improves feedback classification accuracy compared to baseline models, with consistent performance across multiple teaching modes and student

groups. This work contributes to the field by introducing an AI-driven mechanism for real-time teaching assessment, promoting data-informed pedagogical adjustments, and offering a scalable approach applicable to broader educational contexts.

奥林匹克教育

本期奥林匹克教育学术研究共检索到英文相关文献 104 篇，研究热点主要集中在大型体育赛事、女性运动员、身体素养等方面。检索结果如下：1) 关键词共词分析。提取关键词 488 个，经过数据清洗后关键词有 452 个，词频为 4 及以上的关键词有 3 个，累计百分比为 3.69%，高频关键词有身体体格、团队运动、二氧化碳排放等，生成可视化知识图谱（见下图）。2) 来源期刊分析。涉及期刊 73 种，其中载文 2 篇及以上的期刊有 17 种，累计百分比为 46.2%，刊载奥林匹克教育相关内容前三位的期刊分别为：INTERNATIONAL JOURNAL OF SPORTS SCIENCE&COACHING (JCR 学科分区 Q2、Q3)、SPORT IN SOCIETY(JCR 学科分区 Q3、Q2)、COMMUNICAION &SPORT (JCR 学科分区 Q1、Q2)。3) 交叉学科分析。引用文献总计 5962 篇，最多的频次为 6 次，频次排名前三的文献分别为 *Defining training and performance caliber: a participant classificaion framework*、*What makes an event a mega-event? Definitions and sizes*、*The international tourism effect of hosting the Olympic Games and the FIFA World Cup*。4) 学术关注度分析。文献级别用量最多的是 18 次，排名前三位的文献分别 *Old question, new methods: Revisiting the economic effects of hosting mega-sport events*、*Exploring the dynamic relationship of telepresence, presence, authenticity, and revisit intention in AR enents*、*Measurement report: variations and environmental impacts of atmospheric N₂O₅ concentrations in urban Beijing during the 2022winter Olympics*。



Herold DM, Caregnato AF, Costa IP, et al. Transition from Sports Career to post-sports Career: a Study with High-performance Brazilian Olympic Ex-Athletes[J]. MOVIMENTO, Nov 3 2025.

ABSTRACT

The transition from an active professional life to retirement is an important and decisive moment in one's life, especially when there is planning for financial stability and other guarantees. However, in sports, this transition is fraught with uncertainty. This study aimed to investigate the transition from career to post-career among former Brazilian Olympic track and field athletes. Eight Brazilian track and field athletes who participated in a summer edition of the Olympic Games were interviewed. As a result, athletes choose to retire for various reasons, and academic background remains a concern both during their time as athletes and in the post-career period. We concluded that the transition to the post-career lacks an organized plan that encompasses various aspects of the sports career, including support from public and private entities in Brazil.

dos Santos GL, Monteiro MB, Saad G. The Regulatory Network of Olympic Stakeholders: Relationships and Where does the 'local' Stand[J]. PUBLIC MANAGEMENT REVIEW, Oct 2025.

ABSTRACT

This research systematically identifies the network of Olympic stakeholders as defined by the regulatory framework governing the Olympic Games. Through Social Network Analysis, it identifies primary stakeholders, maps their relationships, and assesses power dynamics across the network. Given the increasing importance of local support for the Games bidding, preparation and legacy, the positioning of local communities and public authorities relative to other dominant stakeholders is discussed, considering what this means for their capacity to represent public interests in the decision-making process and understand where local contexts are

placed within the formalized structure that binds these stakeholders within the Olympic framework.

Méndez CP, Ruvalcaba DM. International Relations and Sports Performance: An Analysis of the Olympic Medal Table from the World Power Index[J]. MOVIMENTO, Oct 23 2025.

ABSTRACT

This research examines the sports performance of countries from International Relations. Considering that most sports studies overlook systemic imperatives and power as comprehensive element that guide the state action, the aim of this article is to explore the relationship between the international power geostructure and the Olympic medal table. Methodologically, a correlational analysis is conducted between the World Power Index (WPI) and the medal table of the Summer and Winter Olympic Games, from the edition of Atlanta 1996 to Beijing 2022. The findings show a strong and positive correlation across the different Olympiads evaluated. From International Relations this means that the international geostructure defines and determines the design of state sports diplomacy in terms of sports performance: prioritization of sport on the government agenda, medal plans, and resources allocated to elite sport.

Furtado S, Alguren B, Anupriya A, et al. What Health-related Messages Are Promoted During Mega Sports Events? A Multi-country Study of Paris 2024 Olympic and Paralympic Games[J]. INTERNATIONAL JOURNAL OF SPORTS MARKETING & SPONSORSHIP, Oct 2025.

ABSTRACT

Purpose This study is a first exploration of health promotion messages during a mega sports event. In total, 12 countries were examined for how health-related messages were communicated in relation to the Paris 2024 Olympic and Paralympic

Games via global and national partners. Design/methodology/approach In this study, 12 countries were examined to investigate how the Paris 2024 Olympic and Paralympic Games promoted health. The Global Health Promotion and Sport Events Survey was applied to identified messages produced by global sponsors and national-level sponsors that related to community health, physical health, mental health, environmental health and nutritional health. Findings In total, 238 health-related messages were examined. The vast majority of these messages came from commercial, for-profit entities. When only one type of health was presented, this was often either community/social health, physical health or mental health. Environmental health and nutritional health appeared least often. Nearly half of the messages involved a combination of health types. Research limitations/implications Paris 2024 was used by many corporate partners and National Olympic Committees to actively promote health-related messages around the world. A strength of this study was that it involved data collection from a range of countries. Practical implications: There are increasing concerns about detrimental effects from commercial determinants of health. Governing bodies of sport are encouraged to review partnerships which do not promote health. Social implications: There is opportunity to use the mega events to promote more specific actions relating to health, since the Olympic and Paralympic Games are occasions where social connection and celebration are likely to be inevitable. Originality/value: This study offers an audit tool and sets a benchmark for understanding how health promotion messages are manifested at sport events.

Sandbakk O, Loland S. Records At What Cost? A Critique of the Enhanced Games[J]. INTERNATIONAL JOURNAL OF SPORTS PHYSIOLOGY AND PERFORMANCE, Dec 2025.

ABSTRACT

Purpose: The recently announced Enhanced Games (EG) positions itself as a

revolutionary alternative to the Olympic Games, proposing a sporting event in which performance-enhancing drugs are not only permitted but medically supervised and celebrated. Founded by Dr Aron D'Souza, the initiative markets itself as a more transparent, scientific, and technologically progressive and equitable model of elite sport. In contrast to the World Anti-Doping Agency's long-standing global commitment to banning doping substances, the EG advocates for full transparency and deregulation of enhancement practices, aiming to eliminate what is perceived as hypocrisy in contemporary elite athletics. The purpose of the current commentary is to critically evaluate the medical, societal, ethical, and regulatory consequences of the EG. Conclusions: We argue that many of the claims made by the advocates of the EG are flawed and the use of scientific rhetoric is often misleading. Moreover, we argue that the EG represents a high-risk social experiment with potentially profound medical, societal, and ethical consequences that abandons the principles that govern current elite sports: respect for athlete autonomy and health, fair competition, and the quest for sporting and human excellence. We point to the need for a renewed commitment to these principles, not their abandonment. Contrary to the EG, strengthening antidoping systems and investing in safe, evidence-based performance support are all viable paths forward. The EG may produce new records but challenge radically the moral relevance and nature of sport.

van Lienden A. Representing Churandy: The Making of A Black Dutch Caribbean Sporting Celebrity in Dutch Media[J]. JOURNAL OF SPORT & SOCIAL ISSUES, Dec 2025.

ABSTRACT

This study examines the mediatized (self-)representations in Dutch media of Churandy Martina, a sprint athlete from the Dutch Caribbean island of Curaçao and a prominent figure in Dutch Olympic delegations between 2012 and 2024. Within this period, Martina was ostensibly embraced by European Dutch

audiences to an unprecedented level for Black Dutch Caribbean athletes, whose presence in Dutch Olympic delegations has risen in recent years due to constitutional changes in the Kingdom of The Netherlands. Drawing on cultural studies, postcolonial theory, and critical race studies, this article analyzes how Martina's identity as a Black Curaçaoan athlete was constructed and made legible to European Dutch media audiences and through which discursive frames his celebrity status was constructed. Through a textual analysis of Dutch newspaper and television coverage across four Olympic Games, complemented by interviews with Martina and a member of his media team, the study identifies four dominant representational regimes: Radicalized initialization, echoes of the dangerous Black Antillean male, a healer of innocent Dutch Whiteness, and Black athletic commodification. Ultimately, the article argues that Martina's media (self-)representation illustrates how Black sporting celebrities can be both celebrated and commodified through representational frames which simultaneously reinforce enduring racialized power structures within postimperial national contexts.

Gale JT, Peddie MC, Gerrard D, et al. 24-h Movement Patterns: Sleep, Sedentary Behaviour and Physical Activity of Older Retired Olympic and Commonwealth Games Athletes-An Observational Study[J]. AUSTRALASIAN JOURNAL ON AGEING, Oct 10 2025.

ABSTRACT

Background: Increasing age is associated with reduced physical activity and greater time spent sedentary. However, participation in competitive sport in early adulthood can promote physical activity in older age. To provide insight, this study aimed to objectively and contextually describe the 24-h movement patterns of retired elite New Zealand athletes. Methods: Twenty-eight adults aged over 60years (mean 74 +/- 7years) who represented New Zealand at an Olympic or Commonwealth Games provided data for this cross-sectional study. Participants completed data collection in

their homes and then wore two accelerometers continuously for 7 days: an ActiGraph GT3X+ on the wrist and an ActivPAL on the thigh. Participants also completed three 24-h activity recalls. Periods of time spent sedentary, sleeping and physically active were determined by validated cut points and algorithms. Results: Participants spent an average of 7 h 8 min (SD 58 min) per night asleep; 43% of participants were short sleepers (< 7 h/night). Participants spent an average of 3 h 20 min (SD 40 min) engaged in light-and 2 h 22 min (SD 1 h 1 min) engaged in moderate-to-vigorous physical activity per day. On average, participants spent 46% of their day sedentary. Walking and outdoor work/gardening were the most reported types of activity. Conclusions: This group of retired New Zealand elite athletes engaged in physical activity exceeding the amount recommended for extra health benefits by the World Health Organization. A significant number of participants were identified as having insufficient sleep and may benefit from an intervention to improve overall sleep duration.

Masismadi NA, Wylde M, Tan CZX, et al. A Framework for Sporting Success. Definitions and Measures from Research on Sports Featured in the 2014-2028 Olympic Games: A Scoping Review[J]. INTERNATIONAL JOURNAL OF SPORTS SCIENCE & COACHING, Dec 2025.

ABSTRACT

This scoping review explores the concept of 'sporting success' by examining its diverse definitions and measures across Olympic Games sports and regions in contemporary research literature. Following the Joanna Briggs Institute methodology for scoping reviews and the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews guidelines, a systematic search was conducted in SPORTDiscus, PubMed, Web of Science, PsycINFO, MedLINE, and Scopus databases for articles published from January 1, 2019, to December 31, 2023, using the query: (succe*) AND (sport* OR athlet* OR player*).

A framework of sporting success definitions and measures was proposed based on thematic analyses of 434 articles, identifying five primary themes: 'Placing', 'Performance Indicators', 'Opportunity Milestones', 'Accolades', and 'Career Capital'. 'Placing'-related definitions and measures were most prevalent in research literature. These findings underscore the multifaceted nature of sporting success, challenging the notion of universal definitions and questioning the validity of assumed conceptualisations within academic research - particularly as 135 articles failed to provide any explicit definition. The review offers valuable guidance for enhancing talent development research by advocating for greater precision in defining and measuring sporting success through the inclusion of contextual details - age category, sex, level of competition and specific nation - and optional application of arithmetic derivations. The proposed framework provides adaptable criteria for reporting study populations, guiding the selection of variables to be reported and complementing existing classification approaches. Furthermore, sporting organisations may benefit from recognising and addressing mismatches between success metrics and athletes' aspirations, fostering compromise where needed.

McLeod CM, Knoester C. Parental Expectations for Children's Future Athletic Achievement: The Roles of Socio-Economic Status, Race, Ethnicity, Gender, and Athletic Experiences and Identities[J]. JOURNAL OF SPORT & SOCIAL ISSUES, NOV 2025.

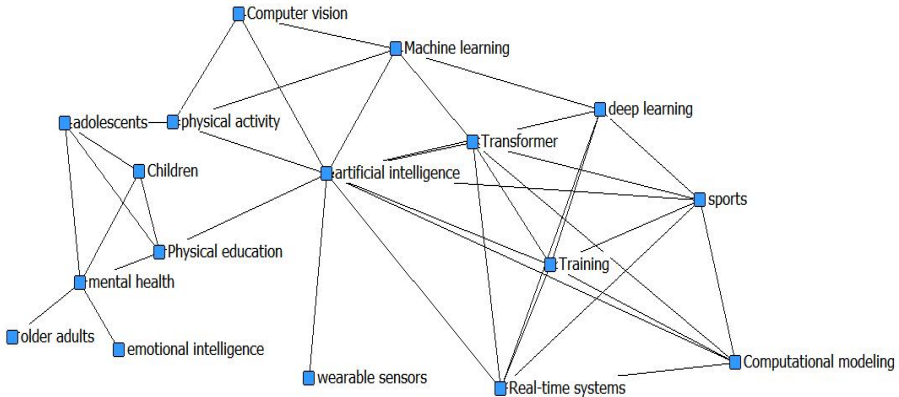
ABSTRACT

Sociological theories propose contradictory predictions regarding the influence of underlying social inequalities on parents' sport expectations. This study used data from a national survey of adults to examine how, why, and to what extent parents' expectations for athletic achievement are linked to underlying social inequalities. Logistic regressions using data from parents (n = 676-690) revealed factors associated with expectations of their children becoming a small college, college

scholarship, or professional or Olympic athlete. Although most parents had realistic expectations, a meaningful proportion of parents appeared to have unrealistically optimistic expectations. Higher expectations were apparent among parents of younger children, who perceived their children to have stronger athletic identities seemingly born out of their sport participation histories, who were sport fans, who had children that were Black or Latinx, who lived in neighborhoods with more non-White families, and, when it came to expectations of becoming a professional or Olympic athlete, who were from a lower socioeconomic status position. The child's gender and the parent's gender were not significantly related to athletic expectations and socioeconomic status was inconsistently related to expectations of becoming a college athlete. The results supported some theoretical arguments and contradicted others, and they can be used to target educational messaging around youth sport practices.

体育人工智能

本期体育工程学术研究共检索到英文相关文献 275 篇，研究热点主要集中在 TENG 技术助力智能运动、用于智能体育的机器学习辅助摩擦纳米发电机技术、6G 支持多虚拟网络用于虚拟现实中的可扩展体育教育与训练、基于 GABP 神经网络和人工智能的运动训练效果研究等。检索结果：1) 关键词共词分析。提取关键词 1477 个，经过数据清洗后关键词有 1241 个，词频为 4 及以上的关键词有 17 个，累计百分比为 12.05%，高频关键词有人工智能、机器学习、体育活动、深度学习、运动等，生成可视化知识图谱（见下图）。2) 来源期刊分析。涉及期刊 201 种，其中载文 4 篇及以上的期刊有 10 种，所载文献累计百分比为 19.28%，刊载体育人工智能前三位的期刊分别为：SCIENTIFIC REPORTS (JCR 学科分区 Q1)，FRONTIERS IN PSYCHOLOGY (JCR 学科分区 Q2)，HEALTHCARE (JCR 学科分区 Q2、Q2)。3) 学科交叉分析。引用文献总计 20717 篇，最多的频次为 7 次，排名前三位的分别为 *OpenPose: Realtime Multi-Person 2D Pose Estimation Using Part Affinity Fields*、*Deep learning*、*World Health Organization 2020 guidelines on physical activity and sedentary behaviour*。4) 学术关注度分析。文献级别用量最高的是 163 次，排名前三位的分别为 *TENG-Boosted Smart Sports with Energy Autonomy and Digital Intelligence*、*Machine learning-assisted triboelectric nanogenerator technology for intelligent sports*、*The mediating role of self-regulation in fostering Intelligent-TPACK and ethics in physical education teacher education students*。



Wang YL, Gao ZH, Wu W, et al. TENG-Boosted Smart Sports with Energy Autonomy and Digital Intelligence[J]. NANO-MICRO LETTERS, DEC 2025, vol.17, issue 1.

ABSTRACT

Technological advancements have profoundly transformed the sports domain, ushering it into the digital era. Services leveraging big data in intelligent sports-encompassing performance analytics, training statistical evaluations and metrics-have become indispensable. These tools are vital in aiding athletes with their daily training regimens and in devising sophisticated competition strategies, proving crucial in the pursuit of victory. Despite their potential, wearable electronic devices used for motion monitoring are subject to several limitations, including prohibitive cost, extensive energy usage, incompatibility with individual spatial structures, and flawed data analysis methodologies. Triboelectric nanogenerators (TENGs) have become instrumental in the development of self-powered devices/systems owing to their remarkable capacity to harnessing ambient high-entropy energy from the environment. This paper provides a thorough review of the advancements and emerging trends in TENG-based intelligent sports, focusing on physiological data monitoring, sports training performance, event refereeing assistance, and sports injury prevention and rehabilitation. Excluding the potential influence of sports psychological factors, this review provides a detailed discourse on present challenges and prospects for boosting smart sports with energy autonomy and digital intelligence. This study presents innovative insights and motivations for propelling the evolution of intelligent sports toward a more sustainable and efficient future for humanity.

Ji ML, Wang Z, Wu, JM, et al. Machine Learning-Assisted Triboelectric Nanogenerator Technology for Intelligent Sports[J]. SCIENCE ADVANCES, OCT 1 2025, vol.11, issue 40.

ABSTRACT

The rapid development of internet of things, big data, and artificial intelligence is propelling sports science into a data-driven era, demanding real-time, multidimensional athletic performance monitoring. Triboelectric nanogenerators (TENGs) have demonstrated exceptional potential in intelligent sports. However, the complexity and volume of TENG-generated data pose challenges for manual analysis. Machine learning (ML), with strengths in pattern recognition and adaptive processing, provides a powerful solution to enhance TENG-based sensing signal interpretation. This review systematically explores the integration of ML and TENG technology for intelligent sports. First, the fundamental theory and basic knowledge of TENGs are introduced, highlighting their versatility in sports sensing systems. Subsequently, a comprehensive overview of ML models for TENG signal analysis is discussed. Recent advancements of ML-assisted TENG-based intelligent sports applications, including sports training evaluation, sports health monitoring, and virtual/augmented reality sports, are then highlighted. Last, current challenges and future prospects of TENG-based intelligent sports systems are discussed.

Feng YJ, Ma ZS, Meng S. Multiple Virtual Networks Supported by 6G for Scalable Sports Education Teaching and Training in Virtual Reality for Consumer Applications[J]. IEEE TRANSACTIONS ON CONSUMER ELECTRONICS, NOV 2025, vol.71, issue 4, pp.11161-11170.

ABSTRACT

The advent of 6G networks has the potential to enable advanced virtual reality (VR) systems for scalable consumer-oriented sports education (SE) teaching and training. Scalability, real-time performance, and effective delivery of immersive consumer SE

experiences are all problems for today's network architecture. Although VR is increasingly being used for remote consumer SE teaching, existing networks struggle to support numerous virtual networks while maintaining sufficient bandwidth and low latency for consumer-level applications. The research investigates the use of 6G-enabled multiple virtual networks to improve consumer SE teaching and training in VR. The goal is to create an optimal framework that facilitates real-time interactions while adapting and improving the virtual training experience for increased performance and scalability through the use of deep learning (DL) techniques, specifically designed with consumer usability in mind. The dataset is made up of consumer-generated movement sensor data, such as joint locations, angles, and velocities, as well as additional parameters like heart rate and calories burned. Data was preprocessed using Min-Max normalization to scale the features, ensuring compatibility with deep learning models and improving convergence. This data is used to train DL models such as Dynamic Walrus Optimized Intelligent Deep Belief Networks (DynWO-IntDBN) to evaluate and improve consumer SE in a VR scenario. DynWO-IntDBN models are used to examine and forecast consumer (student) performance in virtual environments. The suggested method optimizes resource allocation in 6G networks, ensuring continuous real-time interaction between instructors and consumer participants. The DynWO-IntDBN model has been improved to recognize specific physical actions and deliver actionable feedback tailored to consumer performance. The findings show that the framework performs well in terms of accuracy ratio (98.87%), performance ratio (97.4%), F1 score (95.8%), and efficiency ratio (95.9%). Therefore, the 6G-enabled virtual network infrastructure is a positive step forward for enhancing consumer engagement and effectiveness in sports education through immersive VR technologies.

Li LF, Hao AY. Research on the Sports Training Effect Based on GABP Neural Network and Artificial Intelligence[J]. SCIENTIFIC REPORTS, NOV 10 2025, vol.15, issue 1.

ABSTRACT

With the increasing need for precision and personalization in athletic training, artificial intelligence (AI) offers powerful tools for monitoring, evaluating, and optimizing athlete performance. This study presents a Generalized Adaptive Backpropagation (GABP) neural network that combines Genetic Algorithms (GA) with Backpropagation (BP) to model physiological adaptation and guide data-driven training decisions. The proposed system is designed specifically for sports training contexts, emphasizing real-time feedback and individualized load management based on multivariate physiological inputs. The GABP model extends traditional backpropagation networks by incorporating genetic algorithms, which accelerate convergence, reduce the risk of local minima, and enhance predictive accuracy. By integrating diverse input modalities—such as physical performance indicators, training schedules, and biometric data from wearables, video analysis, and electromyography (EMG)—the system achieves high-precision evaluation of training effectiveness. In addition to detecting fatigue and performance plateaus, the model provides interpretable insights to refine training strategies at both individual and programmatic levels. Experimental validation on physiological datasets demonstrates measurable improvements in prediction accuracy and convergence efficiency. This work contributes a domain-specific, interpretable, and adaptive modeling framework for modern sports science, supporting personalized coaching and intelligent performance monitoring.

Li YX, Wang L, Wang ZY, et al. Intelligent Optimization of Track and Field Teaching Using Machine Learning and Wearable Sensors[J]. SCIENTIFIC REPORTS, OCT 21 2025, vol.15, issue 1.

ABSTRACT

Traditional track and field education relies heavily on subjective assessment and manual feedback systems, creating critical barriers to personalized instruction in large-scale educational settings. This study presents a novel machine learning framework for optimizing track and field teaching through intelligent analysis and personalization of instructional content. This study developed a multi-layered system architecture integrating wearable IMUs (200 Hz), high-definition cameras (120fps), and force platforms to capture comprehensive biomechanical data from 312 undergraduate participants across three semesters. The system employs a hybrid CNN-BiLSTM architecture with ensemble learning methods for real-time performance analysis. Main Contributions: Our framework introduces (1) an integrated multi-modal sensing system for comprehensive movement analysis, (2) a novel ensemble architecture combining CNN-BiLSTM with gradient-boosted trees for superior classification accuracy, and (3) an adaptive learning optimization algorithm based on reinforcement learning principles. The hybrid CNN-BiLSTM architecture outperformed baseline models in classification tasks for multiple sports with F1-scores ranging from 0.88 to 0.94 and beat the traditional benchmarks by a remarkable 27.3% in time-to-proficiency and 41.2% in injury risk. Validation through ablation studies confirmed that component synergies yielded 17.3% greater performance than individual subsystems. The system shows promise for practical wide-scale implementation in postsecondary education and professional athletic training. This work establishes a foundation for data-driven pedagogical transformation in physical education.

Hua SR, Wang X, Kang JT. Intelligent Sensor Fusion and LSTM-Transformer-Based Model for Sports Behavior Prediction in Teaching and Training[J]. JOURNAL OF CIRCUITS SYSTEMS AND COMPUTERS, OCT 2025.

ABSTRACT

In sports teaching and training, intelligent sensor fusion technology provides comprehensive and real-time data support for athletes through high-precision sports data acquisition and efficient fusion processing capabilities. Subsequently, this paper describes the process of smart sensor data fusion in detail, including data preprocessing (such as data cleaning, filling missing values, correcting errors), feature extraction, data association and data fusion, to ensure the quality and consistency of the subsequent input motion information data. In the prediction of sports behavior, the traditional LSTM has high computational complexity and resource consumption when dealing with long sequence data. To solve this problem, this paper proposes an algorithm based on LSTM and Transformer, which can capture the long-term dependence in time series motion data and improve the efficiency and quality of gesture sequence extraction. In order to further improve the prediction accuracy, the discrete cosine transform (DCT) technology is introduced to remove the miscellaneous information and only retain the main features. In the experimental simulation, the MPJPE results of different algorithms in walking, jumping, gymnastics and other movements are compared to verify the effectiveness of the proposed algorithm. The experimental results show that the MPJPE results of LSTM + Transformer algorithm are better than those of other algorithms in the prediction time, which solves the problems of accuracy and efficiency in sports behavior prediction and action analysis in sports teaching and training.

Wang SB, Bai ZQ, Gai YH. Toward Intelligent Clinical Support for Personalized Sport Training Rehabilitation via Large Language Models[J]. HEALTH INFORMATION SCIENCE AND SYSTEMS, DEC 22 2025, vol.14, issue 1.

ABSTRACT

Effective sport-training rehabilitation demands exercise prescriptions that adapt to each patient's changing symptoms and adherence patterns, yet most recommender systems rely on either numerical logs or handcrafted rules, failing to exploit the rich information embedded in free-text feedback. How can we unify linguistic self-reports with temporal behaviour to produce more accurate, interpretable training recommendations under real-world data sparsity? We introduce ReLite, a three-stage architecture that (i) encodes exercise reviews with a fine-tuned large language model, (ii) refines session histories via a lightweight Transformer, and (iii) aligns semantic embeddings with ordinal ratings through multi-head cross-attention before a dual-head MLP outputs continuous and ordinal tolerance scores. We conduct a series of experiments on two public dataset. The experimental results demonstrate that integrating large-scale language understanding with task-specific sequence modelling and adaptive text-rating alignment yields a robust, data-efficient foundation for intelligent clinical support in personalised sport-training rehabilitation.

Zhao ZH, Chai WH, Hao SY, et al. A Survey of Deep Learning in Sports Applications: Perception, Comprehension, and Decision[J]. IEEE TRANSACTIONS ON VISUALIZATION AND COMPUTER GRAPHICS, OCT 2025, vol.31, issue 10, pp.9368-9386.

ABSTRACT

Deep learning has the potential to revolutionize sports performance, with applications ranging from perception and comprehension to decision. This article

presents a comprehensive survey of deep learning in sports performance, focusing on three main aspects: algorithms, datasets and virtual environments, and challenges. First, we discuss the hierarchical structure of deep learning algorithms in sports performance which includes perception, comprehension and decision while comparing their strengths and weaknesses. Second, we list widely used existing datasets in sports and highlight their characteristics and limitations. Finally, we summarize current challenges and point out future trends of deep learning in sports. Our survey provides valuable reference material for researchers interested in deep learning in sports applications.

Yu QY. Multi Modal Hierarchical Reinforcement Learning Framework for Dynamic Sports Sponsorship Optimization[J]. SCIENTIFIC REPORTS, DEC 18 2025, vol.15, issue 1.

ABSTRACT

This paper presents a novel approach to optimizing sports sponsorship strategies by integrating reinforcement learning (RL) with a multi-modal hierarchical framework, enhancing real-time decision-making using diverse data sources such as computer vision, natural language processing, and graph neural networks (GNNs). The system utilizes RL to dynamically optimize sponsorship strategies across strategic, tactical, and operational levels. Using the Meta-Soft Actor-Critic (Meta-SAC) algorithm, it adapts to real-time data streams, including social media sentiment, event footage, and stakeholder interactions. Our system demonstrates a 25-35% improvement in ROI, a 20-30% increase in brand exposure, and a 15-25% rise in audience engagement compared to conventional strategies. The proposed RL-driven, multi-modal framework significantly outperforms traditional methods, providing scalable, adaptive solutions for optimizing sports sponsorship effectiveness.

Hou Y, Wang ZY, Qin GAI, et al. Driven 6G Network Slicing for Distance Collaborative Sports Training: Edge Cloud Resource Allocation Strategy[J]. IEEE TRANSACTIONS ON CONSUMER ELECTRONICS, NOV 2025, vol.71, issue 4, pp.11198-11206.

ABSTRACT

The rapid evolution of communication networks has paved the way for developing 6G technology, which promises ultra-low latency, massive connectivity, and enhanced intelligence. In distance collaborative sports training, where athletes and coaches operate remotely, real-time data transmission, seamless connectivity, and adaptive network management are crucial. It presents an AI-driven 6G network slicing approach integrated with deep learning techniques to enhance real-time performance tracking, and enable virtual coaching in collaborative basketball training. A novel Adaptive Pelican Optimized - Elman Spike Neural Network (APO-ESNN) model is employed to dynamically allocate resources based on real-time demand, ensuring efficient training sessions. The edge cloud in 6G sports training facilitates low-latency processing, AI-driven analytics, and optimal bandwidth allocation, enabling seamless communication, individualized coaching, and effective resource utilization to improved athlete performance. In a 6G environment, multiple network slices optimize sports training. The video streaming slice handles real-time video, the sensor data slice ensures low-latency wearable data transmission, and the AI processing slice analyzes sensor data for individualized coaching. Customization adjusts slices based on training requirements. The experimental framework was developed using Python software (version 3.10), and achieved a resource allocation efficiency of 92% and a training session efficiency of 85%, demonstrating significant improvements in network utilization and session productivity. This AI-driven, data-powered basketball training system highlights the transformative potential of 6G network slicing in revolutionizing collaborative sports training while advancing real-time sports analytics and interactive training

experiences.

Wang T, Yan X, Li JW, et al. Football Sports Automatic Judgment Model Based on Improved YOLOv7 and RNN[J]. PLOS ONE, NOV 5 2025, vol.20, issue 11.

ABSTRACT

The extraction, classification, and judgment of sports video scenes can improve work efficiency and accuracy. To understand sports videos in dynamic scenes, this study applies deep learning technology, firstly introducing clustering algorithm and attention mechanism to improve the target detection technology You Only Look Once v7, and identifying the targets existing in the scene. Then, the sparrow search algorithm in artificial intelligence algorithm is taken to optimize the parameter search of the recurrent neural network and automatically extract the target scene. After introducing three optimization strategies, the proposed model achieved a detection accuracy of 0.993 (as measured by classification accuracy), a floating-point calculation times of 244, and a detection speed of 264.245 fps. The average detection accuracy of this model was 0.95, and the loss function curve converged with the minimum number of iterations and convergence value. The maximum correlation accuracy was 0.958, and the detection accuracy was 0.926. Meanwhile, the model had the highest intersection over union ratio and recall rate on different datasets, reaching 0.885 and 0.961 respectively on the TrackingNet dataset. The improved scene extraction model had the smallest three error values, with the highest accuracy of 0.932, F1 of 0.955, and subject working characteristic curve area of 0.969. The R-squared value and semantic consistency of scene extraction perform well, improving the accuracy and fairness of football sports judgment. This study proposes an innovative solution to address sports video scene recognition, improving the accuracy of sports video scene recognition and bringing new effective technological means to the field of sports video analysis. Meanwhile, this study

contributes to the rapid development of the sports industry and promotes the automation and popularization of football.

Boey D, Girard O, Lee M, et al. Unlocking the Potential of Video-Based Markerless Motion Analysis to Study World-Class Sporting Performance[J]. JOURNAL OF SPORTS SCIENCES, OCT 2025.

ABSTRACT

The ability to access and assess technique of world-class athletes in-competition has long eluded sport biomechanists due to the constraints of 3-dimensional marker-based motion capture systems. Encouragingly, the advent of video-based markerless motion analysis offers the opportunity for unobtrusive capture of sporting performances in-competition. This narrative review explores the progression of markerless systems from laboratory-like to in-competition analysis. It first explores the accuracy of markerless motion analysis for joint kinematics in dynamic and sporting movements. Next, its utility in competition is explored with ways to validate these in-competition set-ups. Existing in-competition set-ups offer a viable foundation for skeletal tracking but still requires rigorous validation. Tennis is proposed as an example where the current in-competition infrastructure may support high-fidelity motion analysis. On top of the advanced hardware (i.e. camera configurations) that has been heavily invested in, software optimization methods proposed in computer vision research (i.e. enhancing data processing efficiency, expanding and refining training datasets with anatomically-accurate labelling and sport-specific data, and increasing the quantity and types of keypoints detected), can potentially improve its accuracy for in-competition analysis. Ultimately, a markerless system rigorously validated under real-world constraints can bridge the gap between accessing and assessing world-class sporting performances for sport biomechanics.

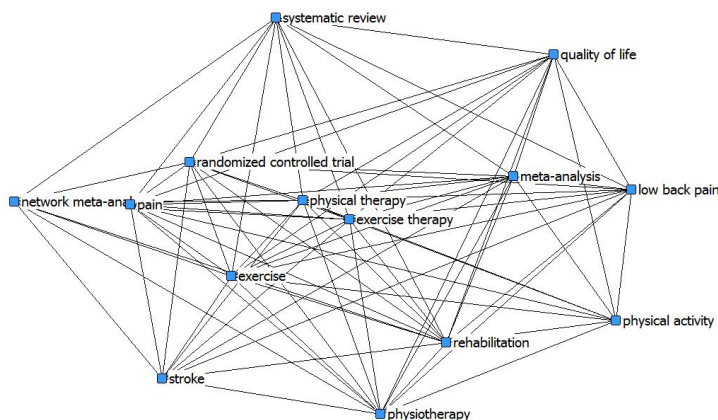
Gulgosteren E, Ermis SA, Toros AA, et al. Sweat, Tears, and Beyond: Advanced Wearable Sensors for Personalized Health and Athletic Performance[J]. FRONTIERS IN BIOENGINEERING AND BIOTECHNOLOGY, NOV 28 2025, vol.13.

ABSTRACT

This review investigates the transformative potential of wearable sensors for body fluid monitoring in sports and healthcare. These devices offer a non-invasive, real-time, in-situ glimpse into our health by continuously tracking vital biomarkers found in sweat, saliva, urine, and tears. We discuss various sensor technologies, including electrochemical, optical, and microfluidic, and the innovative materials like hydrogels and nanocomposites that enable their functionality. The integration of RFID and flexible electronics is also examined, highlighting how these advancements improve the connectivity, portability, and user-friendliness of the sensors. Moreover, we delve into the advanced manufacturing techniques, such as 3D printing, that are crucial for crafting these sophisticated devices with high precision and adaptability. In prospect, this article evaluates the transformative potential of integrating these in-situ sensors with artificial intelligence and machine learning, envisioning a paradigm shift in health monitoring and athletic performance optimization.

体医融合

本期体医融合学术研究共检索到英文相关文献 1180 篇，研究热点主要集中在心肌病患者的运动参与与康复、改善 2 型糖尿病患者血压的不同类型体育活动最佳剂量与有效性、慢性静脉功能不全的运动疗法等方面。检索结果如下：1) 关键词共词分析。提取关键词 5559 个，经过数据清洗后关键词有 3679 个，词频为 4 及以上的关键词有 146 个，累计百分比为 26.21%，高频关键词有锻炼、运动疗法、康复、生活质量、理疗等，生成可视化知识图谱（见下图）。2) 来源期刊分析。涉及期刊 533 种，其中载文 5 篇及以上的期刊有 48 种，所载文献累计百分比为 38.68%，刊载体医融合前三位的期刊分别为：JOURNAL OF CLINICAL MEDICINE（JCR 学科分区 Q1、Q1），BMJ OPEN（JCR 学科分区 Q1、Q2），SCIENTIFIC REPORTS（JCR 学科分区 Q1、Q1）。3) 学科交叉分析。引用文献总计 59346 篇，最多的频次为 56 次，其次是 31 次，这两篇文献分别为 *The PRISMA 2020 Statement: An Updated Guideline for Reporting Systematic Reviews*、*RoB 2: a Revised Tool for Assessing Risk of Bias in Randomised Trials*。4) 学术关注度分析。文献级别用量最多的是 58 次，排名前三位的文献分别为 *Research Advances in the Diagnosis and Treatment of MASLD/MASH*、*Gut Microbiota-Immune System Interactions in Health and Neurodegenerative Diseases: Insights into Molecular Mechanisms and Therapeutic Applications*、*Multilevel Analysis of the Central-peripheral-target organ Pathway: Contributing to Recovery After Peripheral Nerve Injury*。



Russo D, Gambardella C, Volterrani M, et al. Exercise Participation and Rehabilitation in Cardiomyopathies: An Updated Review[J]. JOURNAL OF CLINICAL MEDICINE, Dec 2025, vol.14, issue 24.

ABSTRACT

Cardiomyopathies, including hypertrophic (HCM), dilated (DCM), and arrhythmogenic (ACM) forms, represent a challenge in cardiovascular medicine, in particular regarding exercise participation and cardiac rehabilitation. Traditionally, physical activity was restricted in these patients due to concerns over arrhythmic risk and sudden cardiac death. However, current evidence suggests that individualized exercise programs, under clinical supervision, can enhance functional capacity, improve quality of life, and sometimes prognosis in selected patients. Contemporary European and North American guidelines suggest that participation in competitive sports may be reasonable for athletes with genetic cardiomyopathies, provided that individual risk is regularly and systematically reassessed. The aim of this review is to synthesize current evidence on exercise training, sports participation and rehabilitation in the three major cardiomyopathies-hypertrophic, dilated, and arrhythmogenic-which have informed the latest international guideline recommendations. Particular attention is given to the essential role of shared decision-making, highlighting the importance of a personalized approach based on the specific type of cardiomyopathy, arrhythmic risk stratification, and individual patient factors. In addition, the review addresses two emerging clinical scenarios: sports participation in patients with implantable cardioverter-defibrillators and current recommendations for genotype-positive/phenotype-negative individuals at risk of cardiomyopathy.

Foster E, Langer L, Bayley M, et al. Promoting Early Aerobic Exercise Initiation After Concussion[J]. AMERICAN JOURNAL OF PHYSICAL MEDICINE & REHABILITATION, Oct 2025, vol.104, issue 10, pp.875-882.

ABSTRACT

Objective Research on aerobic exercise post-concussion has focused on athletes recovering from sport-related concussion. The goal of this pilot study was to examine the feasibility and preliminary efficacy of three aerobic exercise prescription methods in a general adult population. Design This pilot study involves three cohorts of participants, including a nested randomized component. Participants who were not in the nested randomized component were followed regularly by the clinic physician ("usual care"). Participants in the nested randomized component were randomly assigned to either "exercise testing + usual care" or "exercise testing + individualized prescription." All randomized participants completed a Buffalo Concussion Treadmill Test. Exercise testing + usual care received usual care aerobic exercise recommendations, while exercise testing + individualized prescription received an individualized prescription based on their Buffalo Concussion Treadmill Test performance. Results Seventy-five participants were included in this analysis. There was an observed longer time to recovery of usual care compared to exercise testing ($P = 0.046$). There was no significant difference in time to recovery between exercise testing + usual care and exercise testing + individualized prescription ($P = 0.35$). Conclusions Supervised initiation of aerobic exercise early after concussion appears to be feasible and improve outcomes compared to standard exercise recommendations. Individualized aerobic exercise prescription offered no additional recovery benefit in this sample; however, this finding is likely underpowered because of a small sample.

Álvarez-Barbosa F, Ramos-Munell J, del Pozo-Cruz J, et al. Optimal Dose and Effectiveness of Different Types of Physical Activity to Improve Blood Pressure in People with Type 2 Diabetes Mellitus: A Systematic Review and Network Meta-analysis[J]. REVIEWS IN ENDOCRINE & METABOLIC DISORDERS, Nov 2025.

ABSTRACT

People with type 2 diabetes have higher rates of hypertension compared to the general population, Current guidelines do not consider the baseline blood pressure for activity prescription. This study aimed to evaluate and compare effects of different physical activity modalities on blood pressure in individuals with type 2 diabetes mellitus considering baseline blood pressure levels and exploring the dose-response relationship. A systematic search was performed in CINAHL, EMBASE, MEDLINE, Scopus, SportDiscus and WOS databases to June 2025. A dose-response network meta-analysis of 71 trials (3,970 participants) was conducted. Studies included individuals with type 2 diabetes who underwent any physical activity intervention with reported blood pressure outcomes. Meta-regressions included baseline blood pressure as a covariate. Aerobic activity significantly reduced systolic blood pressure (SBP) in stage 1 (-5.37 mmHg) and stage 2 hypertension (-8.32 mmHg). Mind-body activities showed no effects, particularly in more severe hypertension (-13.35 mmHg). Resistance training was most effective for elevated SBP. Both aerobic and mind-body exercises improved diastolic blood pressure (DBP). A significant overall dose-response association was found, but it was not maintained when analyses were stratified by exercise modality, indicating that the observed benefits likely reflect overall physical activity exposure rather than modality-specific effects. Resistance training may be most effective for elevated SBP, aerobic activity for stage 1-2 systolic hypertension, and mind-body therapies for more severe diastolic hypertension. Optimal effects were achieved at approximately 826 and 994 METs-min/week for

SBP and DBP, respectively.

Fujita D, Kubo Y, Tanaka R, et al. Frequency, Intensity, Time, and Type Prescription in Exercise Therapy for Chronic Venous Insufficiency: A Scoping Review[J]. PHLEBOLOGY, Dec 2025.

ABSTRACT

Exercise therapy aimed at increasing calf muscle pressure can effectively prevent and improve chronic venous insufficiency. However, as the 'frequency, intensity, time, and type' model that is critical in prescribing exercise has not been identified, determining the exact amount and quality of exercise to be prescribed is challenging. Therefore, we conducted a scoping review of exercise therapy for chronic venous insufficiency and mapped the exercise therapy prescriptions provided to these patients. The CENTRAL, CINAHL, MEDLINE, and PEDro databases were searched. Data charting was conducted to categorise the types of exercise into aerobic and resistance exercises, light exercise, and aquatic activity. The intensity, duration, and frequency of each exercise were mapped and summarised as narrative syntheses. Of 594 articles, 27 met the eligibility criteria. Aerobic exercise comprised a frequency of 2-3 times/week; intensity, 12-16 on the Borg scale or 40-70% of the maximum heart rate; time, 20-40 min; and type, walking, treadmill, or ergometer. Resistance exercise comprised a frequency of two times per week to every day; intensity: 8-12 repetition maximum; time: 10-25 times x 2-5 sets; and type: elastic band or more. Aquatic activity comprised a frequency of two times per week to every day, time: 15-60 min, and type: balneotherapy; exercise intensity could not be specified. In conclusion, these results provide useful information for planning exercise therapy for chronic venous insufficiency and can be used for improving patients' physical performance and quality of life.

Verma KK, Driskill J, Nguyen KT, et al. Exercise Therapy as a Novel Intervention for Notalgia Paresthetica: A Brief Narrative Review[J]. ARCHIVES OF DERMATOLOGICAL RESEARCH, Oct 2025, vol.317, issue 1.

ABSTRACT

This review investigates exercise as a treatment modality for notalgia paresthetica (NP), a sensory neuropathy of the upper back. The manuscript summarizes current research on the effectiveness of stretching, strengthening, and postural correction exercises for treating NP symptoms. Proposed mechanisms of action include alleviating nerve compression, improving posture, increasing local blood flow, and modulating pain perception via neuroplasticity. Exercise therapy should be considered as a first-line treatment option for NP, since it provides a non-pharmacological approach to symptom reduction and better patient quality of life. Exercise therapy for NP is supported by case reports and pilot studies, but requires larger randomized controlled trials before being adopted into clinical guidelines.

Huang Z, Zhuang Y, Lin T, et al. Efficacy of Exercise Therapies on Functional Dyspepsia: A Systematic Review and Meta-analysis[J]. DIGESTIVE AND LIVER DISEASE, Nov 2025, vol. 57, issue 11, pp.2087-2098.

ABSTRACT

Drug therapy is the primary treatment for functional dyspepsia (FD), but exercise therapy may offer a promising, safe, and effective adjunct. This meta-analysis evaluated the effectiveness of exercise therapy compared to conventional treatments for FD. We reviewed randomized controlled trials (RCTs) published up to October 13, 2024, from five databases. Pooled estimates were calculated using random-effects models, with outcomes expressed as risk ratio (RR), mean difference (MD), or standardized mean difference (SMD), and 95 % confidence intervals (CI).

Subgroup analyses were performed based on the control treatment methods. Fifteen RCTs involving 1359 FD patients were included. All studies reported symptom improvement, with nine assessing the effective rate, and four evaluating overall symptom scores. Key symptoms, such as epigastric fullness and pain, showed improvements, and exercise therapy also enhanced quality of life (6 studies), sleep quality (2 studies), and reduced depression (2 studies). Additionally, exercise therapy was associated with changes in the endocrine levels of MTL, GAS, and VIP, although not all hormones were equally affected. No serious adverse events were reported. In conclusion, exercise therapy significantly benefits FD patients across various aspects, providing valuable insights for future treatment strategies. (c) 2025 Editrice Gastroenterologica Italiana S.r.l. Published by Elsevier Ltd. All rights are reserved, including those for text and data mining, AI training, and similar technologies.

Kurose R, Wakai Y. Effect of Lower Limb Exercise Therapy on the Patients with Rheumatoid Arthritis: An Analysis Based on Severity of Joint Damage[J]. MODERN RHEUMATOLOGY, Nov 2025.

ABSTRACT

Objective Exercise therapy is widely recommended for patients with rheumatoid arthritis (RA), but the ideal parameters and appropriate patient selection remain controversial. This study aimed to assess the effectiveness and safety of lower limb exercise therapy in RA-affected knees, stratified by radiographic severity of joint destruction. Methods We retrospectively analysed RA patients who participated in a 3-month lower limb exercise therapy. Participants were divided into two groups according to the Larsen grading classification (LG): mild destruction (LG II-III) and advanced destruction (LG IV-V). Functional outcomes and disease activity parameters were compared between two groups of LG II-III and IV-V. Results Patients in the LG II-III group showed improvements in lower limb functions,

including enhanced strength of the gluteus muscles, with no worsening of RA disease activity. Conversely, some patients in the LG IV-V group experienced declines in the 10-m walk time, timed up and go test, patient visual analogue scale, and stair climbing ability. Some patients in the LG IV-V group had intensified anti-rheumatic drug therapy. Conclusions Lower limb exercise therapy appears safe and effective for RA knees with mild destruction but may risk functional decline in patients with advanced damage. Radiographic evaluation is essential for tailoring therapy to individual joint status.

Xie Y, Xu S, Dai R, et al. Comprehensive Review of Therapeutic Efficacy and Underlying Mechanisms of Various Exercise Modalities in Treating Osteoporosis[J]. AGING AND DISEASE, Dec 2025.

ABSTRACT

Osteoporosis (OP) is a major public health challenge affecting over 200 million individuals worldwide. While pharmacological interventions represent mainstream treatment, concerns regarding longterm side effects and patient compliance have driven the exploration of alternative therapies. Exercise interventions have emerged as promising complementary approaches due to their excellent safety profiles, costeffectiveness, and high adherence rates. Diverse exercise modalities, including aerobic, resistance, and balance exercises, effectively modulate bone homeostasis by promoting osteogenesis, inhibiting osteoclastogenesis, enhancing muscle-bone crosstalk, regulating the vascular/lymphatic systems, and modulating inflammation. This review synthesizes current knowledge on exercise-based therapies for musculoskeletal disorders, with a particular emphasis on their anti-OP mechanisms, which target osteoblast-and osteoclast-mediated bone homeostasis, endocrine regulation, immune function, and muscle performance. Furthermore, we explore the potential of combining exercise with other therapies and systematically compare the clinical efficacy of various exercise types. This review provides deeper mechanistic

insights into exercise-mediated bone protection and offers evidence-based perspectives for developing innovative therapeutic strategies in OP management.

Liu M, Ren T. Impact of Personalized Exercise Prescription on Muscle Mass, Physical Function, and Quality of Life in Postoperative Pancreatic Cancer Patients Undergoing da Vinci Robotic Surgery: A Randomized Controlled Trial Protocol[J]. TRIALS, Oct 2025, vol.26, issue 1.

ABSTRACT

BackgroundPancreatic cancer is characterized by a 5-year survival rate of less than 12%, primarily because of challenges in early diagnosis, which has resulted in a generally poor prognosis for patients. With ongoing advancements in diagnostic and surgical technologies, there is an increasing focus on enhancing the postoperative quality of life for individuals with pancreatic cancer. Although existing research suggests that exercise interventions are safe for this patient population, definitive evidence regarding their efficacy remains insufficient. Consequently, this study aims to conduct a randomized controlled trial to assess the safety and efficacy of exercise interventions in enhancing muscle mass, physical function, and quality of life among patients who have undergone surgery for pancreatic cancer.MethodsA total of 168 eligible postoperative pancreatic cancer patients will be enrolled and randomly allocated in a 1:2 ratio to either the intervention group or the control group. Participants in the intervention group will receive a personalized exercise prescription for a duration of 16 weeks, whereas participants in the control group will not receive any specific exercise prescription or intervention. The primary outcomes of this study include Changes in muscle mass, specifically the skeletal muscle index and density, from baseline to week 16, as well as assessments of physical function using the 6-Minute Walk Test (6MWT) and evaluations of quality of life through standardized scale scores. Secondary outcomes comprise assessments using the Functional Assessment of Cancer Therapy Fatigue Scale (FACT-F), the

Hospital Anxiety and Depression Scale (HADS), and the Pittsburgh Sleep Quality Index (PSQI). Measurements of outcome indicators other than muscle mass will be conducted at weeks 0, 4, and 12, respectively. Discussion The impact of the personalized exercise prescription intervention will be evaluated through alterations in primary and secondary outcome indicators at both the 4-week intervention mark and the 12-week follow-up period. This trial aims to offer novel clinical insights into the efficacy of personalized exercise prescriptions in enhancing muscle mass, physical function, and quality of life among postoperative pancreatic cancer patients. Trial registration Clinical Trial Registry-China ChiCTR2500098709. Registered on 12 March 2025.

Kwon YR, Kim Y, Kim YS. Exercise-induced Modulation of IGF-1 in Healthy, Obese, and Cancer Populations: A Systematic Review and Meta-analysis[J]. ANNALS OF MEDICINE, Dec 2025, vol. 57, issue 1.

ABSTRACT

Background This systematic review and meta-analysis evaluated the effects of chronic exercise on circulating insulin-like growth factor 1 (IGF-1) across different populations, including, healthy adults, individuals with obesity, and cancer patients or survivors. To minimize confounding, we excluded trials combining exercise with medications, hormone therapy, or structured dietary interventions. **Materials and Methods** PubMed and Embase were searched through July 2024 for randomized controlled trials (RCTs) in adults (≥ 18 years) with exercise interventions lasting ≥ 8 weeks, a non-exercise control group, and reported changes in serum IGF-1. Twenty-one RCTs with 1376 participants met the inclusion criteria. Pooled weighted mean differences (WMD) with 95% confidence intervals (CI) were calculated, and trial sequential analysis was used to assess robustness. **Results** Exercise significantly increased IGF-1 in healthy individuals (WMD=21.41, 95% CI 8.01-34.81) and in those with obesity (WMD=15.46, 95% CI

-1.07-31.99), consistent with metabolic and anabolic benefits via the GH-IGF-1 axis. In contrast, exercise significantly reduced IGF-1 in cancer patients or survivors (WMD=-14.71, 95% CI -19.77 to -9.65). In studies reporting both IGF-1 and IGF-binding protein 3 (IGFBP-3), exercise increased IGFBP-3 in healthy and cancer populations, suggesting a modulatory role of IGFBP-3 in IGF-1 regulation, particularly in cancer. Conclusion Chronic exercise exerts health status-dependent effects on circulating IGF-1, supporting metabolic benefits in healthy and obese individuals and potentially contributing to cancer care by reducing IGF-1 in cancer patients or survivors. These findings demonstrate the complex endocrine response to exercise and support the therapeutic potential of tailored exercise prescriptions.

Ogrezeanu DC, Núñez - Cortés R, Salazar - Méndez J, et al. How Much Aerobic Exercise Is Needed to Reduce Migraine? A Dose-Response Meta - Analysis of Pain Intensity and Frequency[J]. HEADACHE, Oct 2025.

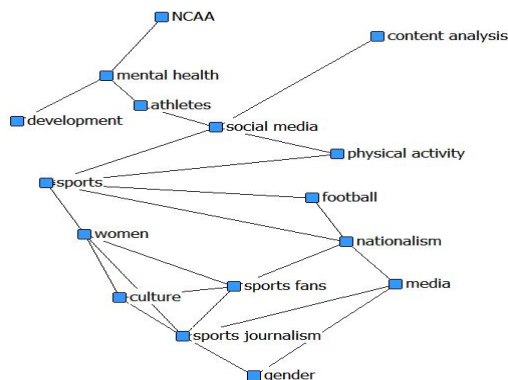
ABSTRACT

Background Evidence suggests that exercise has clinically relevant benefits for migraine, but an optimal prescription standard remains undefined. We aimed to assess the effectiveness of aerobic exercise on migraine intensity and frequency through a dose-response meta-analysis. Methods A data search was performed in PubMed, PEDro, Google Scholar, and EBSCO from inception to September 1, 2024. Randomized controlled trials and quasi-experimental studies of aerobic exercise in patients with a clinical diagnosis of migraine were included. The outcome measures were pain intensity and migraine frequency. The dose-response relationship was evaluated using a dose-response meta-analysis. Results Fifteen studies (253 participants) were included. Meta-analysis showed a statistically significant decrease in pain intensity between pre and post intervention (standardized mean differences [SMD], -1.1; 95% confidence interval [CI], -1.72 to -0.47). The spline model showed a U-shape statistically significant association ($\chi^2 = 112.03$, $df = 2$, $p <$

0.001) between total minutes of aerobic exercise and reduction in pain intensity. A minimum dose of 200 min was required for moderate effects, with a maximum effect at 900 min (SMD, -2.4; 95% CI, -2.85 to -1.95). Meta-analysis showed a statistically significant decrease in migraine frequency between pre and post intervention (SMD, -0.79; 95% CI, -1.1 to -0.47). The spline model showed a U-shape statistically significant association ($\chi^2 = 86.41$, $df = 2$, $p < 0.001$) between total minutes of aerobic exercise and reduction in migraine frequency. A minimum dose of 300 total minutes of aerobic exercise program duration was required to obtain a moderate effect in reducing migraine frequency, with a maximum effect at 950 min (SMD, -1.55; 95% CI, -1.87 to -1.22). Conclusions This meta-analysis suggests that aerobic exercise may be effective in reducing both pain intensity and migraine frequency in people with migraine. The greatest observed effect on both variables was observed at a cumulative dose of approximately 900-950 total minutes of aerobic exercise during the program, and higher doses may not present additional benefits. These findings support a preliminary recommendation of 3 weekly 30-min sessions over 10-11 weeks, to be confirmed in future high-quality trials. Plain Language Summary: Migraine is a common condition that can be improved with exercise but the ideal amount is still unclear. We reviewed studies on aerobic exercise in people with migraine and found that patients who engaged in approximately 900 min over the course of treatment (e.g., 30 min sessions three times per week for 10-11 weeks) reported significantly reduced pain and number of migraine attacks. Higher amounts of aerobic exercise did not lead to greater benefits, suggesting an optimal range for exercise prescription.

文化与新闻传播

本期文化与新闻传播学术研究共检索到英文相关文献 281 篇，研究热点主要集中在探索体育新闻制作中的男性化文化、人工智能时代体育记者的角色认知、社交媒体对中国 Z 世代女孩体育活动满足感的变革性影响等方面。检索结果如下：1) 关键词共词分析。提取关键词 1341 个，经过数据清洗后关键词有 1184 个，词频为 3 及以上的关键词有 21 个，累计百分比为 9.25%，高频关键词有社交媒体、体育、体育新闻、体力活动、性别等，生成可视化知识图谱（见下图）。2) 来源期刊分析。涉及期刊 145 种，其中载文 3 篇及以上的期刊有 23 种，累计百分比为 48.4%，刊载文化与新闻传播前三位的期刊分别为：COMMUNICATION & SPORT（JCR 学科分区 Q1、Q2），SPORT IN SOCIETY（JCR 学科分区 Q3、Q2），INTERNATIONAL JOURNAL OF SPORTS MARKETING & SPONSORSHIP（JCR 学科分区 Q2、Q2）。3) 交叉学科分析。引用文献总计 15463 篇，最多的频次为 9 次，其次是 7 次，这两篇文献分别是：*Reflecting on Reflexive Thematic Analysis*、*New Rules for New Times: Sportswomen and Media Representation in the Third Wave*。4) 学术关注度分析。文献级别用量最多的是 61 次，排名前三位的文献分别为 *Part II. Common Questions and Misconceptions about Creatine Supplementation: What does the Scientific Evidence Really Show?*、*Pixels, Poses, and Power: A Multimodal Analysis of Self-Representation and Femininity Among Female Fitness Influencers on Chinese Social Media*、*DHMDL: Dynamically Hashed Multimodal Deep Learning Framework for Racket Video Summarization Using Audio and Visual Markers*。



Brien, AO. Masculine Cultures of Sports Journalism Production: A Case Study of Irish Sports Journalists' Approaches to Gender Equality in Sports Coverage[J]. JOURNALISM, Oct 2025.

ABSTRACT

This paper examines sports journalists' understandings of the gendered aspects of producing sports content for Irish media. Using a small-scale qualitative study, with a purposive sample of 15 journalists, the paper explores whether journalists see the masculinist culture of sports news production as a key site of gender change. The findings note that respondents saw gender inequality in sports media as a historical legacy issue. Barriers to more equitable coverage were described in terms of practical challenges, available space and resources, legacy practices, knowledge-deficits and a dependence on individual advocates. Respondents did not name a masculinist culture of sports production as a key barrier to change. The mechanisms that sports journalists believed were needed to promote gender equality were located in factors that were extrinsic to the masculinist culture of the newsroom. Respondents flagged the importance of social media activism, women's sporting success and investment in infrastructure as relevant to change. They highlighted roles for NGBs, sources, sponsors, and male allies. Despite some adjustments to include more women the masculinist culture of sports journalism largely goes unquestioned and so women in sport remain the exception to the rule of sport journalism as inherently masculine.

Krouglov AY. Digital Spectacles, Convergent Realities: Deconstructing the Sport-media-business Nexus in an Era of Extended Media[J]. CONVERGENCE-THE INTERNATIONAL JOURNAL OF RESEARCH INTO NEW MEDIA TECHNOLOGIES, Dec 2025.

ABSTRACT

This article explores the transformative effects of digital media on the

sport-media-business nexus. The approach is an analytical focus on a wide range of sports, examined from a theoretical framework that integrates institutional and organizational perspectives on mediatization with critical theories of hyperreality and the society of the spectacle. Based on a deconstruction of contemporary global sport, it is demonstrated that digital platforms are a major concern across the entire sporting landscape and that a new wave of mediatization is reconfiguring the nature of spectatorship and fandom. Still, many aspects of this digitally inflected reality are in a state of flux, with emergent forms of community and engagement existing alongside new modalities of control and commercialization. Consequently, one of the significant effects of convergent media is the dispersion of the sporting experience across multiple platforms, involving a concurrent increase in the complexity of power dynamics between leagues, media corporations, and audiences. Mediatization is, therefore, a process operating at many levels and at various speeds, which also takes sport in diverse and often contradictory directions. Employing the theoretical lenses of Baudrillard, Debord, and Turner, updated through contemporary scholarship on convergence culture, it is argued and demonstrated that the fusion of sport and convergent media demands a critical examination of platform governance, datafication, and the very future of community in an increasingly hyperreal world. This research offers a new perspective by establishing a conceptual framework for sociological inquiries into sport's technological and economic interface. This analysis engages directly with recent scholarship to update and sharpen the critique of commercialized sport, concluding that the evolving sportscape necessitates a critical interrogation of its intricate power relations.

Humayun MF. “Not Here to Babysit a Robot”: Sports Journalists’ Role Perception in the Age of AI[J]. JOURNALISM PRACTICE, Nov 2025.

ABSTRACT

This study examines how U.S. sports journalists perceive and articulate their professional roles amid the emerging discourse and experimental integration of artificial intelligence (AI) in newsroom practices. Drawing on role theory and the concept of boundary work, the study analyzes in-depth interviews with 43 sports journalists employed across print, broadcast, and digital platforms. While industry narratives frame AI as a means of increasing newsroom efficiency, participants expressed deep skepticism about its use in sports reporting, particularly when automation encroaches on interpretive, relational, and ethical dimensions of journalistic labor. Journalists emphasized the distinctiveness of human-authored storytelling, audience trust, and narrative judgment-qualities they argue are incompatible with algorithmic production. The findings reveal that sports journalists are not passively responding to technological change; rather, they are actively reaffirming their epistemic authority and drawing professional boundaries to defend against the deskilling and depersonalization of their work. This research contributes to growing scholarship on AI and journalism by offering a grounded analysis of how journalists in a historically marginalized beat navigate automation and assert their relevance in a shifting media environment.

Xu Y, Pan H, Qian J. Inclusive Heights: Media and Community Partnerships in Re-navigating Paraclimbing in Confucianism-influenced China[J]. COMMUNITY DEVELOPMENT JOURNAL, Dec 2025.

ABSTRACT

This study explores the role of community partnerships and media collaborations in advancing inclusivity in paraclimbing within the Confucianism-influenced context in China. Drawing on qualitative case studies of two climbing gyms, the research analyzes how media visibility and celebrity involvement function both as catalysts for inclusion and as forms of symbolic capital, sometimes serving organizational or state interests as much as community empowerment. The findings highlight how

media collaborations amplify visibility, challenge societal biases, and normalize disability in sports, whilst community-driven initiatives address systemic barriers and foster inclusive grassroots sports culture. Situated within the broader frameworks of social inclusion and community development, this study offers actionable strategies for scaling adaptive climbing initiatives in China. By integrating participatory approaches with cultural sensitivity, the research highlights the transformative potential of collaborative efforts to empower marginalized groups, promote equity, and reshape societal perceptions of disability. This work contributes to ongoing discussions on the interplay between media, community action, and sustainable inclusivity in sports.

Zheng H, Xiang Z, Yang W, et al. The Shaping of Adolescent Physical Activity Habitus: The Role of Family Sports Culture[J]. PLOS ONE, Dec 2025, vol.20, issue 12.

ABSTRACT

Based on Bourdieu's habitus theory, this study revealed the connotation, function, and shaping mechanism of physical activity habitus. Utilizing a stratified random cluster sampling survey conducted across 16 public undergraduate universities in Chongqing, China, the data were quantitatively analyzed using factor analysis and OLS regression analysis models to explore the impact of family sports culture on the formation of adolescent physical activity habitus in primary school, middle school, and high school. The study constructed two main dimensions of adolescent physical activity habitus: self-report physical behavioral capacity and physical behavioral inclination. Further research indicates that family sports culture may maintain a certain correlation with the two dimensions of adolescents' physical activity habits throughout their entire educational trajectory. Moreover, it is noteworthy that factors such as family economic status, paternal education level, gender, and urban-rural disparities appear to demonstrate weaker associations with adolescents' physical

activity habits when compared to the influence of family sports culture. In conclusion, this study suggests that family sports culture during the primary school stage may represent a potentially critical factor in shaping adolescents' physical activity habits. Therefore, it is imperative for all sectors of society to pay more attention to the construction of family sports culture.

Humayun MF. Deprofessionalization of US Sports Journalism? Exploring Metajournalistic Discourse Through the Case of Sports Illustrated and Generative AI[J]. JOURNALISM STUDIES, Dec 2025.

ABSTRACT

On 27 November 2023, it was reported that Sports Illustrated (SI) was publishing AI-generated content on its website. The writers of this content were listed as humans, had human names and photos, and a short biography describing their history and interest in sports. What made the story stand out was the fact that SI was using generative AI to publish this content. This study examines the journalistic discourse on SI from November 2023 to May 2024. The purpose is to analyze how U.S. sports journalists and external actors discussed the threat of AI-generated content and authorship to SI and other legacy sports media. Results suggest that sports journalism may be in a battle for legitimation as a profession due to perceived threats from advances in generative AI.

Shi K, Bruce T, Henley M. Social Media's Transformative Impact on Chinese Gen-Z Girls' Gratifications in Physical Activity[J]. COMMUNICATION & SPORT, Dec 2025.

ABSTRACT

Anchored in uses and gratifications theory, this study investigates how social media is reshaping Chinese Gen Z youths' interpretations of the long-held cultural belief that girls should not participate in sport or physical activities. As Part of a broader

study that also involved an anonymous quantitative survey of 722 high school students, this article focuses on the results from four focus groups involving 33 high school students, all of whom also completed the survey. The focus groups revealed a marked gender difference in perspectives about the appropriateness of sport and physical activity for girls outside school contexts. While males report no family opposition to participation, over half the female participants faced some opposition. However, once female participants became teenagers they engaged in information-seeking on social media to gratify their desire for new ideas and information about sport and physical activity. This process of digital information-seeking enabled them to contest and reframe traditionally restrictive gender norms.

Koronios K, Dimitropoulos P, Ntasis L. Strategic Management of Social Media in Mega Sports Events: An Integrated Framework for Sponsorship and Engagement[J]. JOURNAL OF MANAGEMENT & ORGANIZATION, Dec 2025.

ABSTRACT

Social media has become a strategic driver of sponsorship effectiveness in major sporting events. At the 2024 Paris Olympics, digital platforms transformed how sponsorship relationships are formed, sustained, and activated for audience engagement. Yet, the mechanisms through which social media management influences sponsorship outcomes remain underexplored. This study examines the mediating role between core sponsorship antecedents - sport involvement, event attachment, brand familiarity, and sponsor-event congruence - and engagement outcomes. A quantitative survey of 7,412 Greek spectators was analyzed using structural equation modeling to test the proposed framework integrating sponsorship management and digital strategy. Results confirm that social media substantially amplifies the impact of sponsorship factors, fostering stronger sponsor-spectator

connections and enhancing sponsorship returns. This is the first empirical model to link social media usage as a mediating variable between sponsorship antecedents and engagement outcomes in the context of mega-events, with a focus on the Paris 2024 Olympics. The research contributes to theory by positioning social media as a critical mediator in sponsorship strategy and offers actionable insights for managers seeking to optimize sponsorship effectiveness across diverse cultural and event contexts.

Yoo Y, Yang HW, Kim J. The Impact of Virtual Influencers' Anthropomorphism, Attractiveness, Credibility and Sports Knowledge on Consumers' Information-sharing Intentions[J]. INTERNATIONAL JOURNAL OF SPORTS MARKETING & SPONSORSHIP, Dec 2025.

ABSTRACT

PurposeWith the rapid rise of virtual influencers across various fields of digital marketing, there remains limited understanding of why and how they influence consumer engagement on social media. To address this gap, this study examines the impact of virtual influencers' anthropomorphism and attractiveness on consumers' information-sharing intentions. It also investigates the mediating roles of perceived credibility and sports knowledge to understand the effectiveness of virtual influencers in marketing strategies and how these features shape consumer engagement on social media.
Design/methodology/approachThis study employed an experimental design in which 534 South Korean social media users were randomly assigned to one of two types of stimuli and measured participants' perceptions of Virtual Influencers' anthropomorphism, attractiveness, credibility, sports knowledge and information-sharing intentions after observing the stimuli. Structural equation modeling analysis was conducted to examine the mediating effect of perceived credibility and the moderated mediation effect of perceived sports knowledge.
FindingsPerceived credibility fully mediated the effect of physical

attractiveness on information-sharing intention and partially mediated the effect of social attractiveness. While the moderated mediation effect of perceived sports knowledge was not statistically significant, structural path differences emerged between consumers exposed to different types of virtual influencers (sports vs non-sports). Anthropomorphism negatively affected information-sharing intention but was significant only when the virtual influencer was perceived to lack sports knowledge. Brands should prioritize credibility and perceived sports knowledge over superficial traits to foster meaningful connections with consumers. Originality/value This study provides insight into how virtual influencers shape consumer behavior, emphasizing the importance of perceived credibility and sports knowledge. It offers a theoretical framework for understanding virtual influencers' roles in social network services and valuable guidance for leveraging virtual influencers in competitive markets by combining theoretical insights with practical strategies.

Câmpian V, Cerga M. Soft Activism in Sport: Semantic and Sentiment Analysis of Well-Being Narratives Across Elite Multi-Sport Athletes[J]. COMMUNICATION & SPORT, Nov 2025.

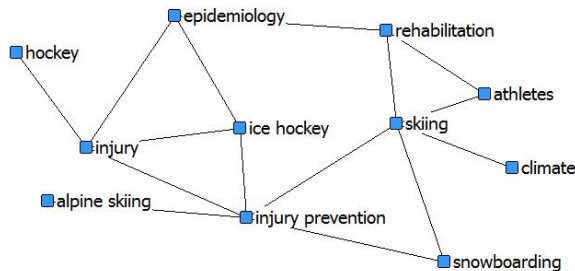
ABSTRACT

Elite athletes increasingly act as influential communicators, shaping public conversations on mental health and well-being. By sharing personal struggles, emotional challenges, and recovery experiences, they engage in soft forms of advocacy, humanizing issues, and reducing stigma. This research fills a gap in athlete communication by providing a multi-sport, multi-country, athlete-centered analysis of well-being narratives, focusing on athletes' own online communications rather than solely on media framing as in previous studies. It advances the field methodologically through the combined use of semantic mapping and sentiment analysis, enabling a gender-comparative, data-driven examination of both thematic

framing and emotional tone of these narratives. Namely, this study analyzes verbatim quotes from ten elite European athletes across diverse sports, including tennis, swimming, basketball, football, motorcycling, gymnastics, and weightlifting. Using semantic mapping and sentence-level sentiment analysis, it examines how athletes frame well-being experiences and how narrative tone, and emotional progression differ by gender. Findings reveal gendered patterns: female athletes adopt reflective, resilience-oriented narratives, progressing toward emotional closure, while male athletes display volatile sentiment trajectories, emphasizing performance restoration and control. These insights demonstrate that athlete narratives serve as soft activism, bridging personal experience and gendered expression, with implications for sports organizations, media framing, and health communication strategies.

冰雪运动

本期冰雪运动学术研究共检索到英文相关文献 415 篇，研究热点主要集中在运动表现、身体功能、运动损伤等方面。就检索导出的数据采用书目共现分析系统（Bicomb V2021）对文献信息进行提取，包括期刊、关键词、标题、发文年份等，相同含义的字段去重且批量合并，同时去除没有实质意义的字段，对所提取的字段进行频次统计，形成高频矩阵，并使用社会网络分析软件 Ucinet 绘制成知识图谱，进行共词聚类分析。检索结果如下：1) 关键词共词分析。提取关键词 2041 个，经过数据清洗后关键词有 1014 个，词频为 3 及以上的关键词有 31 个，累计百分比为 5.44%，高频关键词有预防损伤、传染病、青少年体育等，生成可视化知识图谱（见下图）。2) 来源期刊分析。涉及期刊 309 种，其中载文 3 篇及以上的期刊有 18 种，累计百分比为 18.55%，刊载冰雪运动前三位的期刊分别为：SCIENTIFIC REPORTS (JCR 学科分区 Q1)、MOLECULAR BIOLOGY REPORTS (JCR 学科分区 Q3)、MEDICINE&SCIENCE IN SPORTS&EXERCISE (JCR 学科分区 Q1)。3) 交叉学科分析。引用文献总计 10599 篇，最多的频次为 9 次，频次排名前三的文献分别为 Analysis of relative gene expression data using real-time quantitative PCR and the 2(-Delta Delta C(T)) Method、MEGA11 Molecular Evolutionary Genetics Analysis Version 11、SDT: A Virus Classification Tool Based on Pairwise Sequence Alignment and Identity Calculation。4) 学术关注度分析。文献级别用量最多的是 18 次，排名前三位的文献分别 Smart Curtains for Spontaneous Solar Modulation via Natural Light-Triggered Deformable Shading and Chromogenic Synergy, Fast-Response and Large-Deformation Moisture-Driven Janus Structured Fiber Actuator Composed of Multiscale Hydrophilic-Hydrophobic Interfaces, Thermo-responsive self-adaptive Janus evaporator enabling directional salt rejection and autonomous regeneration for hypersaline desalination。



Jlassi O, Wilkie EWC, Kelly M, et al. Machine Learning-based Classification of Ice Hockey Skating Tasks Using Kinematic Data[J]. SPORTS BIOMECHANICS, Oct 2025.

ABSTRACT

This study evaluates the ability of body segment kinematic data to identify skating tasks in ice hockey using machine learning models and compares the performance of models trained on different body segments. We employed XGBoost, Support Vector Machine and Random Forest models to classify four primary ice-hockey skating tasks: forward skating start and strides, skating stop & go, and skating into a wrist shot. Trunk, pelvis, thigh, shank, and foot segment centre of mass linear accelerations were derived from retro-reflective markers and used as inputs for feature engineering. The models were trained and evaluated using a 10-fold cross-validation stratified by participant. Overall, the machine learning models demonstrated strong performance, with mean accuracy scores ranging from 86.5% to 98.9%. The pelvis yielded the best overall performance, followed by the trunk and foot, whereas the thigh segment generally exhibited lower accuracies across models. These results indicate that prediction performance depends on the body segment kinematic data used as input. This study highlights the potential of body segment kinematic data for automated identification of ice hockey skating tasks, providing insights into sports analytics and player performance assessment.

Shen Y, Sun MY, Zhang YD, et al. A Narrative Review of Injury Characteristics and Risk Factors in Snowboarding[J]. RESEARCH IN SPORTS MEDICINE, Dec 2025.

ABSTRACT

This manuscript reviews and examines the characteristics and risk factors of snowboarding injuries, drawing on research findings from both domestic and international studies. Snowboarding, a prevalent winter activity, is associated with a

relatively high injury incidence, with males generally experiencing higher rates than females, and these rates differ by age group. The most frequent injury locations are the knee (16.1%), followed by shoulder/clavicle (14.3%), and head/face (13.5%). A significant number of these injuries are classified as moderate to severe. Factors influencing snowboarding injuries can be divided into personal and environmental categories. Personal factors such as gender, advanced age, delayed physical maturation, elevated competition level, increased fatigue, and non-standard technical movements increase the risk of injury. Environmental factors, including the state of ski resorts, equipment performance, and fluctuating snow conditions, also contribute to the risk of injury. This synthesis highlights the multifaceted nature of snowboarding injury risk and the need for comprehensive preventive strategies.

Vig KS, Kazley J, Arain A, et al. Ski and Snowboard-Related Spinal Trauma and Spinal Cord Injury A Northeastern Level I Trauma Experience[J]. CLINICAL SPINE SURGERY, Oct 2025.

ABSTRACT

Study Design: Retrospective review. Objective: To review the traumatic spinal injuries in alpine athletes treated at a single level I trauma center. Summary of Background Data: Recreational and competitive skiers/snowboarders are prone to spinal injuries, and recent changes in the sport may have led to increases in the incidence and severity of spinal injuries. Currently, there is a paucity of data on the epidemiology of spinal injuries resulting from skiing and snowboarding. Methods: A review of patients admitted with traumatic spinal injuries from skiing/snowboarding, between January 2015 and March 2019. Data on demographics, spinal region of injury, mechanism of injury, fracture type, presence/absence of spinal cord injury, ASIA score, management, concomitant injuries, and involvement of other surgical services were collected. Results: Spinal injuries were distributed as 33.3% cervical, 57% thoracic, and 38.0% lumbosacral spine. Seventy-five percent patients injured a

single region, 21.7% injured 2 regions, and 3.3% injured all 3. Single-level injuries occurred in 38% patients, II-level in 25%, III-level in 12%, and >3-levels in 28%. Twenty-seven percent patients suffered a spinal cord injury. Eighty-one percent of those had neurological compromise, with a 53.8% rate of full neurological resolution at the time of discharge. 65% fractures were compression-type. Management included operative treatment with decompression and fusion in 32% patients. Cervical spinal injuries were more likely to sustain an extension-distraction type fracture and concomitant spinal cord injury. Thoracic spine injuries were more likely to have multiple vertebral level (>3 vertebrae) involvement. Lumbosacral injuries were more likely to sustain compression type and transverse process fractures. Patients with trauma to all 3 spinal regions were more likely to have translational/rotational injuries, facet fractures, lamina and pedicle fractures, and traumatic anterolistheses. Conclusion: Skiing/snowboarding injuries can be devastating, potentially resulting in permanent neurological compromise and spinal instability. Surgeons and the general population can benefit from improving their understanding of the dangers of alpine sports as it pertains to spinal trauma.

Daggfeld K, Petré H. A Mathematica IModel of Dynamic Skate Blade Holders[J]. PROCEEDINGS OF THE INSTITUTION OF MECHANICAL ENGINEERS PART P-JOURNAL OF SPORTS ENGINEERING AND TECHNOLOGY, Nov 2025.

ABSTRACT

In traditional ice hockey skates with fixed blade holders, a shorter blade radius allows for greater variation in the foot's overall pitch angle as the contact point shifts from the rear to the front of the blade. Therefore, a shorter blade radius can help players better adapt their pitch angle to different skating demands as compared to a longer blade radius. However, reducing the blade radius also decreases the ice contact area, and when the contact becomes too limited, plowing resistance

increases, creating a trade-off that can negatively impact speed and glide. To address this trade-off between maneuverability and glide resistance, a novel dynamic blade holder incorporating a rocker mechanism has been developed. This study presents a mathematical equilibrium model of the dynamic blade holder to evaluate its effect on skate pitch angle. The model demonstrates how the rocker allows independent adjustment of the pitch angle without altering blade curvature, effectively amplifying pitch changes as a function of contact point displacement. Analytical expressions describe this amplification and its dependence on rocker radius, providing practical tools for understanding and optimizing skate design. Future research should examine the biomechanical implications of this approach in real skating scenarios.

Capello MPF, Bizzotto N, Qordja F, et al. Distal Upper Limb Injuries in Skiing and Snowboarding: A Two-Season Study from a High-Volume Trauma Center in the Italian Dolomites [J]. MEDICINA-LITHUANIA, Oct 3 2025.

ABSTRACT

Background and Objectives: Distal upper limb injuries are frequent in winter sports, but their functional impact is often underestimated. This study aimed to describe the epidemiology, mechanisms, and risk factors for injuries involving the forearm, wrist, hand, and fingers sustained during two consecutive winter seasons in the Italian Dolomites. **Materials and Methods:** All adult and willing patients presenting to the Emergency Department of Brixen Hospital after ski- or snowboard-related accidents between December 2023 and March 2025 completed a standardized 23-item questionnaire on demographics, experience level, environmental factors, equipment, and trauma mechanism. For the aim of this study only distal upper limb injuries were extracted and analyzed. Statistical analyses compared fracture versus non-fracture injuries, "good" versus "bad" fractures (AO classification and surgical complexity), and isolated ulnar collateral ligament (UCL) injuries. **Results:** A total

of 195 patients were analyzed: 96 (49.2%) sustained a fracture and 33 (16.9%) presented with isolated UCL lesions. Fractures occurred more frequently on blue slopes (56.2% vs. 33.3%, $p < 0.001$), whereas non-fracture injuries predominated on red and off-piste slopes. Age, BMI, and skill level did not differ significantly between groups. Surgically classified complex distal forearm fractures were significantly more frequent in females ($p < 0.005$) but were not associated with environmental factors. UCL injuries occurred mainly on red slopes (54.5%) and were often related to pole entrapment during falls. None of the injured patients reported the use of protective wrist or thumb supports. Conclusions: Distal upper limb injuries are a common pattern of alpine sports trauma, with wrist fractures and skier's thumb being predominant lesions. Low-speed falls on easy slopes are associated with wrist fractures, while UCL injuries are linked to intermediate slopes. Preventive strategies should include fall technique education, protective gloves, and improved pole ergonomics.

DeLong RN, Brookhart B, Martin C, et al. Identifying Prevention Strategies for Ice Hockey Laceration Injuries[J]. SPORTS HEALTH-A MULTIDISCIPLINARY APPROACH, Dec 2025.

ABSTRACT

Rationale: The International Ice Hockey Federation and USA Hockey are ice hockey governing bodies that have made neck guards mandatory beginning August 2024.^{1,2} These mandates do not include National Hockey league (NHL) or National Collegiate Athletic Association (NCAA) level players. Purpose: To describe life-threatening laceration injuries in ice hockey and identify prevention strategies. Methods: Case summaries for catastrophic ice hockey laceration injuries from the National Center for Catastrophic Sport Injury Research (NCCSIR) were reviewed to describe the mechanism of injury, use of neck protection, and outcome. A Haddon Matrix informed preventative strategies across pre-event, event, and

post-event phases as they relate to the athlete, source (skate, puck, stick), and environment.³Results: NCCSIR captured 26 catastrophic ice hockey laceration injuries from 1982 to 2025 (13 professional/semi-professional, 6 high school, 2 select/junior/adult league, 1 college; ages 13-34). Of these 26 injuries, 24 (92%) were caused by skates, and 1 each by puck and stick. The neck was the body part lacerated most commonly (15, 58%), followed by the arm (6), wrist (2,) leg (1), and eye (1). Of 15 athletes with neck lacerations, 7 were reportedly not wearing neck protection; 8 were unknown/unreported. A total of 5 (19%) injuries resulted in death (ages 13-29 years), and 3 of those 5 athletes were reportedly not wearing neck protection. A Haddon Matrix identified prevention strategies by phase and included pre-event: cardiopulmonary resuscitation (CPR) and first-aid training, stop-the-bleed kits, mandated neck protection; during event: equipment inspection, player training; and post-event: secure a safe space for medical personnel to enter/exit ice and provide quick emergency response.Discussion: Ice hockey is an inherently dangerous sport, and lacerations are a common injury type that can result in serious injury or death. This study highlights the Haddon Matrix as a valuable tool for identifying preventive measures for life-threatening lacerations in ice hockey. Further research should investigate the effectiveness of the strategies proposed.

Gawelczyk M, Kaszuba M, Petr M. Nutritional Strategies for Olympic Biathletes: A Practical Review[J]. NUTRIENTS, Oct 28 2025.

ABSTRACT

Biathlon is a winter Olympic sport that combines high-intensity cross-country skiing with precise rifle shooting. These dual demands require athletes to develop exceptional aerobic capacity while maintaining fine motor accuracy under physiological stress. Despite its complexity, nutritional strategies in biathlon remain under-explored and recommendations are often extrapolated from related endurance sports. This narrative review aims to summarise existing knowledge on nutrition in

biathlon, highlight sport-specific challenges and identify areas for future research. The main findings indicate that biathletes face very high energy demands, with daily expenditure exceeding 7000 kcal during intensive training. Carbohydrates are the primary fuel source, with intake recommendations based on training intensity and duration (6-12 g/kg/d). Furthermore, protein is essential for muscle repair, recovery and adaptation. To achieve the recommended intake of 1.6 g/kg/day, it is advisable to consume meals containing approximately 0.3 g/kg of high-quality protein every three to four hours. Given the frequency of training sessions, effective recovery strategies are important in biathlon. When recovery is a priority, biathletes should consume a meal comprising protein (approximately 0.3 g/kg) and carbohydrates (approximately 1.2 g/kg) before key training sessions. Micronutrient and vitamin deficiencies are not commonly observed in biathletes due to their high calorie intake. However, concerns regarding iron and vitamin D are common among endurance athletes due to the high risk of low energy intake, diets lacking in iron, and insufficient exposure to sunlight. On the day of the race, it is recommended that biathletes plan their meals to ensure that they meet their nutritional needs and begin recovery as soon as possible after the race is over. Biathletes may use specific supplements to enhance performance and health during preparation and competition. However, it is important to note that some supplements that improve performance may harm shooting accuracy. Current guidance is provisional, and future research should adopt a dual-performance framework that evaluates both endurance output and shooting precision under realistic competition conditions.

Khandan A, Fathian R, Carey JP, et al. Variation of Kinematic Metrics With Perceived Fatigue in Ice Skating Measured Using Wearable Sensors[J]. JOURNAL OF STRENGTH AND CONDITIONING RESEARCH, Oct 2025.

ABSTRACT

Khandan, A, Fathian, R, Carey, JP, and Rouhani, H. Variation of kinematic metrics

with perceived fatigue in ice skating measured using wearable sensors. *J Strength Cond Res* 39(10): e1178-e1187, 2025-Enabling to obtain ice skaters' kinematics, wearable technology can track skaters' performance and thus detect performance fatigue in real-world settings. Therefore, this study aimed to investigate the potential of wearable inertial measurement units (IMU) to track skaters' performance, predict perceived fatigue, and detect severe fatigue onset before serious fatigue-related sequelae. In a multistage aerobic experiment, 19 subjects, 2 groups of high- and low-caliber skaters clustered by a novel algorithm, were asked to skate at a self-selected speed around an ice rink. During the experiments, subjects skated with 2 IMUs on their dominant leg's shank and thigh and 4 IMUs on their skates, pelvis, and trunk. These IMU outputs were used to develop 22 kinematic metrics whose variations were monitored with self-reported perceived fatigue by a linear mixed model, considering the effect of caliber. Finally, a machine learning algorithm was implemented to predict severe fatigue onset using the proposed kinematic metrics. The variations of intersegment correlation, joint angle fluctuations, and trunk angle were considerable (6-17% variation) during this intermittent skating experiment. In addition, a gradient-boosting model could predict severe fatigue onset with average precision, sensitivity, accuracy, and F1 score of 75, 81, 74, and 78%, respectively, in 196 skating stages captured from the subjects. The proposed kinematic metrics, as performance indicators, could also indicate perceived fatigue during an aerobic ice skating experiment and predict severe fatigue onset. The kinematic metrics introduced in this study equip coaches with quantitative tools to monitor performance and assess perceived fatigue in ice skating.

Jimenez-Casquet MJ, Conde-Pipo J, Tur JA, et al. Differences in Cardiovascular, Biochemical and Nutritional Parameters Between High- and Low-Altitude Winter Sports Athletes[J]. NUTRIENTS, Nov 24 2025.

ABSTRACT

Background/Objectives: High-altitude hypoxia may affect ECG readings, but it is unclear whether the "live-low-train-high" approach prevents these changes in winter sports athletes. Methods: This cross-sectional study assessed cardiovascular parameters in 102 winter-sport athletes (mean age 20 +/- 4 y; 57% women), divided by training altitude into a high-altitude (HA) group (2500-3300 m, n = 70; skiers/snowboarders) and a low-altitude (LA) group (738 m, n = 32; ice hockey/figure skaters). Mid-season assessments included resting ECG, blood pressure, blood biochemistry, and three 24 h dietary recalls. Results: All ECG parameters were physiological, and no significant differences ($p < 0.05$) were observed in heart rate, PR interval, or QTc between groups. However, HA group exhibited higher systolic blood pressure and a short QT interval. Lactate was significantly higher in HA ($p = 0.028$). The HA diet contained more saturated fat ($p < 0.001$), cholesterol ($p = 0.013$), magnesium ($p = 0.003$) and potassium ($p = 0.001$), whereas LA athletes consumed more glucose ($p = 0.024$). In HA, total energy expenditure correlated positively ($p \geq 0.05$) with QRS ($\rho = 0.52$) and QT ($\rho = 0.56$), while heart rate correlated inversely with vitamin D ($\rho = -0.59$). In LA, QTc showed strong inverse correlations with zinc ($\rho = -0.62$) and selenium ($\rho = -0.85$). Conclusions: This finding suggests that intermittent high-altitude training did not alter ECG patterns when nutrient intake was adequate. High lactate level and specific nutrient correlations point to a residual physiological load and a modulatory role of electrolytes, B-vitamins, and vitamin D on cardiac repolarisation.

Smith M, Zhang BY, Willick S, et al . Association of Temperature and Cloud Conditions with Skiing and Snowboarding Injuries[J]. WILDERNESS & ENVIRONMENTAL MEDICINE, Oct 2025 .

ABSTRACT

Objective To evaluate the association between environmental conditions, specifically air temperature and cloud conditions (eg, sunny, partly cloudy, or

cloudy/foggy), and types of injuries sustained by skiers and snowboarders. Methods We conducted a retrospective observational study of adult patients (≥ 18 y of age) who presented with skiing- or snowboarding-related musculoskeletal injuries at a Utah ski resort clinic during the 2022-24 ski seasons. Data were extracted from electronic medical records and included demographics, injury type, air temperature, and categorized cloud conditions. Statistical analyses included bivariate comparisons using chi(2) analysis and analysis of variance and adjusted analyses using multinomial logistic regression. Results A total of 1813 patients were included; 62.2% were male, and 81.3% were skiers. Ligamentous knee injuries were the most common injury (31.3%). Unadjusted analysis showed a significant association between temperature and injury type ($P < 0.001$), with higher temperatures linked to more upper extremity injuries and lacerations. Cloud condition showed no significant association with injury patterns ($P = 0.99$). In the adjusted analysis, only head injuries remained significantly associated with temperature: For each 1 degrees C increase, the odds of head injury increased by 3.5% (odds ratio=1.04; 95% CI, 1.007-1.06; $P = 0.01$). Cloud conditions were not significantly associated with any injury type. Conclusion Higher temperatures are associated with a modest increase in head injuries among skiers/snowboarders, whereas general cloud conditions do not significantly impact injury type. These findings suggest that while temperature may influence injury risk, particularly for head injuries, other factors likely contribute to injury patterns.