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Edição

Sociedade Científica de Pedagogia do Desporto (SCPD)

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LIVRO DE RESUMOS BOOK OF ABSTRACTS



FICHA TÉCNICA

TECHNICAL SPECIFICATIONS

Livro de Resumos/Book of Abstracts

18.º ENSE Fórum

Sports Education Connect: International Collaboration, Innovation & Technology

26 e 27 de setembro de 2025 – Sport Science School of Rio Maior - Portugal

Editores: Liliana Ramos, Marco Branco, Rafael Oliveira, Vera Simões, Susana Franco

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EDITORIAL

É uma grande honra e um privilégio apresentar esta edição especial, que reúne os resumos das comunicações apresentadas no 18º Fórum ENSE, organizado pela Escola Superior de Desporto de Rio Maior (ESDRM), do Instituto Politécnico de Santarém, Portugal. Esta edição do Fórum, organizada pela Rede Europeia de Educação Desportiva (ENSE) em parceria com a ESDRM, teve como tema crucial e inovador: "SPORTS EDUCATION CONNECT: international collaboration, innovation & technology". Os resumos apresentados neste volume servem de testemunho da investigação dinâmica e multidisciplinar que está a ser desenvolvida na Europa e em outros continentes. Oferecem um panorama do pensamento académico atual e dos avanços práticos em áreas-chave que definem o futuro da educação desportiva, incluindo:

- Divulgação de Projetos Europeus na área do Desporto;
- Inovação e Tecnologia no Desporto;
- Atividade Física e Promoção da Saúde;
- Desporto e Performance;
- Educação Física: Inclusão e Impacto Social.

A localização em Rio Maior, cidade amplamente reconhecida em Portugal pela sua infraestrutura desportiva e excelência académica na área, proporcionou o cenário ideal para este diálogo essencial. A sinergia entre a rede internacional da ENSE e o sólido ambiente académico da ESDRM criou uma plataforma poderosa para o estabelecimento de redes de contactos, debate e a criação de novas colaborações internacionais. Expressamos a nossa sincera gratidão a todos os delegados, apresentadores, oradores principais e moderadores pelas suas contribuições académicas, que enriqueceram o ambiente intelectual do Fórum. Um agradecimento especial ao Presidente da ENSE, Professor António Tessitore, e a toda a Direção da ENSE pela sua visão e apoio inabalável. Agradecemos também o generoso apoio da Revista de Pedagogia e Investigação do Desporto (Journal of Sport Pedagogy & Research) pela realização desta publicação. Além disso, reconhecemos o trabalho crucial tanto do Comité Organizador como do Comité Científico do 18.º Fórum da ENSE, pelos seus esforços meticulosos para garantir o elevado nível e o sucesso deste evento. Estes resumos são mais do que sumários; são projetos para a próxima geração de profissionais, investigadores e intervenientes no desporto. Encorajamos os leitores a explorar esta coleção e a utilizar o conhecimento nela contido para se ligarem aos colegas, inovarem nos respetivos campos e, coletivamente, fortalecerem o futuro da educação desportiva a nível global.

Presidentes do 18º Fórum ENSE

Profª. Susana Franco, PhD | Profª. Vera Simões, PhD

EDITORIAL

It is a distinct honour and a privilege to introduce this special issue, which compiles the abstracts of the communications presented at the 18th ENSE Forum, hosted by the Sport Sciences School of Rio Maior (ESDRM) – Santarém Polytechnic University, in Portugal.

This Forum edition, organized by the European Network of Sport Education (ENSE) in partnership with the ESDRM, was held under the crucial and forward-looking theme: "SPORTS EDUCATION CONNECT: international collaboration, innovation & technology". The abstracts presented within this volume serve as a testament to the vibrant and multidisciplinary research being conducted across Europe and beyond. They offer a snapshot of current academic thought and practical advancements in key areas that define the future of sport education, including:

- European Sport Projects Dissemination;
- Sports Innovation & Technology;
- Physical Activity & Health Promotion;
- Sport & Performance;
- Physical Education: Inclusion & Social Impact.

The location in Rio Maior, a city widely recognized in Portugal for its sporting infrastructure and academic excellence in the field, provided an ideal backdrop for this essential dialogue. The synergy between the international network of ENSE and the robust academic environment of the ESDRM created a powerful platform for networking, discussion and the forging of new international collaborations. We extend our sincere gratitude to all delegates, presenters, keynotes and chairs for their scholarly contributions, which have enriched the Forum's intellectual environment. A special note of thanks goes to the ENSE President, Professor António Tessitore and the entire ENSE Board for their vision and unwavering support. We are also deeply appreciative of the generous support from the Journal of Sport Pedagogy & Research for sponsoring this publication. Furthermore, we recognize the crucial work of both the Organising Committee and the Scientific Committee of the 18th ENSE Forum for their, meticulous efforts in ensuring the high standard and successful execution of this event. These abstracts are more than summaries; they are blueprints for the next generation of sport professionals, researchers and stakeholders. We encourage readers to delve into this collection and utilize the knowledge contained within to connect with peers, innovate in their respective fields and collectively empower the future of sport education globally.

Presidents of the 18th ENSE FORUM

Prof. Susana Franco, PhD | Prof. Vera Simões, PhD

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PROGRAMA/PROGRAMM

26th September

8:30 – 9:30	Registration and Welcome Coffee and Refreshments
9:30-10:45	Oral communications
10:45-11:15	Coffee Break and Social Time/Networking
11:15-12:00	Opening Session
12:00-13:00	Plenary session: Keynote speaker
13:00-14:00	Light Lunch and Social Time/Networking
14:00-15:30	Oral communications
15:30-16:30	e-Poster pitch session
16:30-17:00	Coffee Break and Social time/Networking
17:00-17H30	ENSE General Assembly
17:30-19:00	#BeActive Break/Visit Rio Maior/Social time
20:00	Conference Dinner and Social time

27th September

9:00 – 10:30	Oral communications
10:30-11:00	Coffee Break and Social Time/Networking
11:00-12:00	Plenary session: Round Table Debate
12:00-13:00	Closing Session

Sessão Plenária/ Plenary session 26th September

Título da Preleção/ Conference title: “Digitalization in Sport: A Multidisciplinary Vision.”

Preletor/Keynote speaker: Jorge García Unanue, PhD. (Espanha)

Mesa Redonda/ Plenary session: Round Table Debate 27th September

Título da Mesa Redonda/ Round table title: “Multidisciplinary Teams: Sport and Health for Citizens' Quality of Life”

Moderador/Moderator: Nuno Pimenta, PhD.

Oradores Mesa Redonda/Guests Round Table:

Pedro F. Saint-Maurice, PhD.

Mara Guerreiro, PhD.

Carolina Moreno, PhD.

PROGRAMA COMUNICAÇÕES ORAIS/ORAL COMMUNICATIONS PROGRAM

Sexta-feira/Friday, September 26th - 9:30h - 10:45h

Room 10 Physical Activity & Health Promotion Moderator: Harald Tschan	Room 7 Physical Activity & Health Promotion Moderator: Vânia Loureiro	Room 6 Sport & Performance Moderator: Rafael Oliveira	Room 5 Physical Education: Inclusion & Social Impact Moderator: Rita Santos-Rocha
ID28 _Perceived quality and loyalty intention in fitness group activities Francisco Campos	ID4 _Effect of Hypnosis and Motivational Audio Intervention on Training Frequency in Individuals with Low Motivation Américo Madeira	ID17 _Comparisons Between Sex for Physical Fitness and Body Composition Markers in Badminton Players from the Portuguese National Team André Pito	ID13 _Educating for the Future: Megatrends and Higher Education in Physical Activity and Sport Thomas Skovgaard
ID29 _Effects of a structured exercise program on psychosocial and physical indicators in women with substance use disorder Guilherme Furtado	ID65 _Promoting Motivation and Psychological Well-Being Through Fitness and Resistance Training in Danish Schools Thomas Viskum Gjelstrup Bredahl	ID75 _Comparative analysis of the performance profile of soccer and basketball athletes: towards a mapping of the sport-specific conditional model Giuseppe Di Lascio	ID16 _From Awareness to Action: Rethinking Anti-Discrimination Education Through Sport Louis Moustakas
ID30 _A preliminary proposal for assessing physical fitness in university students through European Fitness Badge Francisco Campos	ID57 _Work-Related Stress, Burnout, and Quality of Life in Radiology Technicians: A Scoping Review Protocol to Inform Workplace Well-Being Strategies Pedro Ramalho	ID35 _Leg length and catastrophe flags during simulated attack distance in taekwondo's young athletes Cristiana Mercê	ID20 _Teaching swimming for understanding: traditional or contemporary learning methods based on multiteaching styles? Gabriele Signorini
ID22 _Fear of Falling as a Mediator between Sarcopenia and Quality of Life in Older Portuguese Adults Margarida Gomes	ID42 _Quality of Life among adults who do and do not engage in Physical Activity and Exercise Vera Simões	ID79 _Analysis of forces during the execution of the gyaku tsuki technique, with and without impact, in 10 year old': An exploratory study Beatriz Olhos	ID25 _Elementary school self-reported physical activity during school time and free- time: Exploratory study Ana Arrais
ID9 _Relationship Between Pre- Pregnancy Physical Activity and Physical Activity During Pregnancy Helena Ferreira Barbosa		ID96 _Descriptive analysis of the men's 100m freestyle Olympic records since 1908 Ana Pereira	ID70 _Active Mathematics bridging Italy and Portugal through dynamic education Francesca D'Elia
		ID83 _Evaluation of Functional Knee Instability in Sports: A Bibliometric Review Protocol Ian Oliveira	ID76 _Physical Education in Primary Schools: International Comparison and Perspectives for Sustainable Development Sara Aliberti

Sexta-feira/Friday/Friday, September 26th - 14:00h - 15:30h

Room 4 European Sport Projects Dissemination: Sharing Knowledge & Best Practices Moderator: Carla Chicau Borrego	Room 5 Sports Innovation & Technology Moderator: Agron Kasa	Room 10 Physical Activity & Health Promotion Moderator: Fátima Ramalho	Room 7 Physical Activity & Health Promotion Moderator: Vera Simões	Room 6 Sport & Performance Moderator: Marco Branco
ID12_Womens Power Network: promoting and empowering healthy and active lifestyles of women across the life cycle. Rita Santos-Rocha	ID71_The effectiveness of eSports in enhancing motor learning and performance in youth football Rosario Ceruso	ID41_The effects of pilates and stick mobility exercises on posture and subjective well-being levels in adolescents Fatma Çelik Kayapınar	ID43_Life4FitnessPro: Job Satisfaction of Fitness Professionals with different types of intervention (online, presential and hybrid) – pilot study Liliana Ramos	ID49_Motor Competence Profiles of Portuguese Children: A Cross-Sectional Comparison of Football, Multisport, Non-Football, and Non-Sport Groups Vitor Padinha
ID19_Pan-European Evaluation of Anti-doping Content Presence in Undergraduate Sport Program Curricula Umutcan KAYIKÇI	ID78_Assessing Sport Science Students' Views on Artificial Intelligence: Perceptions, Attitudes, and Educational Needs Antonio Tessitore	ID45_A Comparative Analysis of Posture-Oriented Learning Outcomes in Middle School Physical Education Curricula: The Cases of Singapore and Türkiye Fatma Çelik Kayapınar	ID56_Relationship between Motor Competence and the 24- Hour Movement Guidelines in Pre-school Children Sandra Trindade	ID81_Gross and fine motor skills development throughout lifespan: A project with nonlinear approach Nancy Brígida
ID94_Solution Strategy Proposal: Sociological Framework for Integrating Standard, Harmonised, Multidisciplinary and Up-to-date Antidoping Education into European Sports Related Undergraduate Programmes' Curricula Umutcan KAYIKÇI	ID34_Body Composition Sex Comparisons in Badminton Players from the Portuguese National Team André Pito	ID38_Effects of a combined exercise programme on physical and mental health in patients with fibromyalgia Mónica Sousa	ID37_Meno(s)Pausa+Movimento: Promoting Active Aging and Health Among Postmenopausal Women Through Community- Based Exercise Sérgio Ferreira	ID60_Anthropometric Variables and Physical Activity in Youth Soccer: Implications for Positional Specialization and Sports Selection Mafalda Bernardino
ID86_Regulation of disciplinary frameworks in European sports body: A comparative analysis Gaetano Raiola	ID14_User Insights on Mobile Apps for Physical Activity During and After Pregnancy Laura Alves	ID8_High-intensity interval resistance training in higher education students: Study protocol for a randomized controlled trial André Bento	ID82_High levels of attention, connection to nature and subjective well-being through walking and sensory exercises Pedro Cuiça	ID36_Hand anthropometry and handball ball diameter children preference Cristiana Mercê

ID87_Comparison between Italy (EU country) and Albania (non-EU country) in sport area as a methodological model in European area Gaetano Raiola	ID97_Analysis of Ground Reaction Forces during walking in the different trimesters of pregnancy Ana Morais	ID11_24-Hour Behavior and Physical Functionality in Active Older Adult Catarina Gonçalves		ID80_Fine Motricity in Finger Tapping Test: Fractal and Entropy Analysis Nancy Brígida
ID100_Universal Sports for Social Impact Project – Adaptation Framework for the Sport Academy Methodology Carlos Silva	ID98_Analysis of intra-segmental coordination between trimesters of pregnancy during gait Ana Morais			ID32_Body Composition, Motor Competence and Physical Fitness in U-15 Soccer Players: Relationship with Physical Activity Mafalda Bernardino
ID99_Healthy lifestyle coach - healthy lifestyle network Europe Carla Chicau Borrego				

Saturday, September 27th - 9:00h - 10:30h

Room 4 European Sport Projects Dis- semination: Sharing Knowledge & Best Practices Moderator: Louis Moustakas	Room 7 Physical Activity & Health Promotion Moderator: Liliana Ramos	Room 6 Sport & Performance Moderator: Antonio Tessitore
ID72_Sustainability and impact of erasmus+ sport martial arts projects Giuseppe Giardullo	ID40_Types and Factors of Mobility in Children's Daily Lives Samuel Honório	ID54_Retrospective analysis of the careers of Portuguese football players Eduardo Teixeira
ID74_Regulation and recognition of sports professions across the European Union Giovanni Esposito	ID90_Group differences in premenstrual symptoms according to sedentary behavior in Portuguese female university students: a pilot study Carlos Vasconcelos	ID104_The Influence of Running Demands in Hamstring Injury in Elite Male Soccer Players. A Comparison Between Injured and Uninjured Players Rafael Oliveira
ID59_Women Coaches in German High- Performance Sports: Findings from the QualiFT Project Lisa Kalina	ID33_Satisfaction with Social Support and Life Satisfaction Among Sports Coaches: A Cross-Sectional Study in Portugal Luis Gonzaga	ID48_The Effect of eight-week Resistance Training Proximity-to-Failure on Bioimpedance-Derived Body Composition and Fluid Parameters Tiago Vasconcelos
	ID103_Inertial Sensor-Based Machine Learning Models for Quantifying Motor Competence in School-Aged Children Marco Branco	ID85_Does Phase Angle distinguish athletes from a regular low and high-water drinker? André Cruz
	ID24_The Impact of Coronary Artery Bypass Grafting on Respiratory Function: A Systematic Review Gonçalo Flores	ID53_Do Balloon and Beach Ball Afford Feet Juggling in 4-6 Years Old Children? Exploring the Role of Multi-sport Practice Francisco Rosa

E-POSTER PITCH SESSION PROGRAM

Friday, September 26th - 15:30h – 16:30h Auditorium 1

Moderador: Margarida Gomes

ID18_ The European Intervention Promoting Mental Well-Being and Social Inclusion in Older Adults through Mindfulness and Cold-Water Immersion

Salvatore Caronna

ID101_ Artificial intelligence as a virtual personal trainer: an educational experiment on user experience in the field of motor skills

Arben Kaçurri

ID102_ Isometric Mid-Thigh Pull (IMTP) testing of physical exercise in artificial way

Arben Kaçurri

ID84_ Inclusive physical education in lower secondary schools

Giuseppe Giardullo

ID50_ Main challenges faced by outdoor sports professionals working with people with disabilities

Nuno Sousa

ID26_ Free play and body mass index in Portuguese basic school children' self- reported physical activity: Exploratory study

Ana Arrais

IDG5_ Pilot study for real time heart rate monitoring validation during front crawl swimming

Gonçalo Moraes

ID88_ Development and Validation of the Boxing Novice Posture and Technique Evaluation scoring system: a new tool for basic boxing technical skills assessment

Francesca Martusciello

ID77_ Illinois Agility Test adapted to the fundamental of leading the ball in basketball

Sara Aliberti

ID73_ Impact of body composition on performance of young basketball players

João Rocha

ID68_ Influence of biological maturation on the force-velocity profile

Nicola Trotta

ID67_ AI Predictive Capabilities in Match Analysis: Expected Goals Differential and Tactical Formations in Serie A 2024/25. A Comparative Study between Inter and Napoli

Giovanni Esposito

ID23_ The Rise of Anterior Cruciate Ligament Injuries in Male Football Players: A Systematic Review on the Impact of Competitive Match Congestion

Francisco Branco

ID15_ Sleep and recovery analysis in elite canoe athlete: A Longitudinal Case Study

Kevin Santos

ID10_ A Systematic Review of Low Back Pain in Equestrian Athletes

Inês Rocha

ID3_ Effects of Hypnosis and Post-Hypnotic Suggestions on the Execution of Ballistic Movements in Combat Sport Athletes

Américo Madeira

Friday, September 26th - 15:30h – 16:30h Auditorium 2

Moderador: Cristiana Mercê

ID6_ Do Wellness Programs Reduce Injuries in Football and Futsal? Insights from a Systematic Review

Rafael Oliveira

ID27_ Laterality and intrasegmental coordination in G-10 years old coin transfer task

Beatriz Olhos

ID31_ Running for Health: Behaviours, Motivations and the Role of Technology and Commerce in Promoting Physical Activity

Luís Gonzaga

ID44_ Effect of a 15 week physical exercise program on body composition and lower limb flexibility in primary school children

Mónica Sousa

ID46_ Impact of a Motor Intervention Program on the Psychomotor Profile and Quality of Life of Older Adults in Day Care Centers: A Multiple Case Study

Daniela Parente

ID51_ Outdoor activities for the promotion of mental health

Marisa Barroso

ID52_Effect of Abdominal Breathing on Cardiorespiratory Parameters in Firefighters

Sara Vasconcelos

ID58_Associations between sleep patterns and cardiometabolic outcomes in middle- aged adults:
a cross-sectional analysis

Fernanda M. Silva

ID62_Long covid associated with insufficient physical activity level among older adults in the
federal district, Brazil

Fabiana Silva

ID63_Extension project – physical exercise for older adults: the experience of the university of Bra-
sília, Brazil

Fabiana Silva

ID64_Assessment of inter-limb strength asymmetry and health care protection in Italian secondary
school

Nicola Trotta

ID8G_Analysis of premenstrual symptoms according to physical activity levels in Portuguese fe-
male university students: a pilot study

Carlos Vasconcelos

IDG1_Physical Fitness and Body Composition in Children in the 1st Cycle of Basic Education:
Comparison by Gender and School Year Variables

Paulino Rosa

IDG2_Analysis of the running between runners, futsal athletes and non-runners: the sensibility of
inertial devices to assess 3D ground reaction forces

Tomás Fernandes

IDG3_Analysis of the running between runners, futsal athletes and non-runners: the sensibility of
inertial devices to assess motor coordination

Tomás

RESUMOS/ABSTRACTS

A Systematic Review of Low Back Pain in Equestrian Athletes

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Resumo/Abstract:

Purpose: This systematic review aimed to determine the prevalence of low back pain (LBP) in equestrian athletes and identify its associated risk factors. **Methodology:** Following the PRISMA guidelines, observational studies published between 2021 and 2024 in English were included. The review identified relevant studies through the B-ON, PUB-MED, CROSSREF and EBSCO databases (last search carried out on 26 April 2025). Three studies were identified with a total of 1265 equestrian athletes, including Portuguese, Italian and Belgian athletes: 347 Portuguese athletes (Dressage riders, riders not involved in national competitions, riders' instructors and other staff); 886 Italian athletes (competition athletes: show jumping, Dressage, CCE, county, reining, endurance reining, driving and hitching; and recreational athletes); and 32 Belgian athletes (Dressage, show jumping, CCE and Icelandic disciplines). **Results and Conclusion:** The question format for the included studies specified the population as equestrian athletes, the exposure as equestrian sports and the outcome as LBP. The prevalence of LBP in equestrian athletes was higher than in the general population and athletes from other sports, due to the main risk factors for LBP such as the practice of the sport itself, due to its specific characteristics, the level of expertise in the sport, the consequences of acute trauma and its poor recovery, asymmetrical posture, poor postural control, the cushioning and depth of the saddle seat, lack of balance, stability, alignment at pelvic level and the type of saddle. Methodological inconsistencies, such as variable definitions of LBP and a lack of standardised exposure assessment, and the general low quality of the studies due to the number of participants and control of some variables limited the comparability of the results. This review emphasised the need for more high-quality research and tailored interventions that address the riding disciplines and fitness training of equestrian athletes.

Palavras-chave/Key Words: Equestrian; Low Back Pain; Horse Riding; Musculoskeletal Disorder; Injury Prevention.

Universal Sports for Social Impact Project – Adaptation Framework for the Sport Academy Methodology

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Resumo/Abstract: Introduction: The Universal Sports for Social Impact Project (USSI) is built on a modular framework designed to empower grassroots sport organizations through innovative, inclusive, and evidence-based training programs. Rooted in judo's values of respect, discipline, and cooperation, the methodology also integrates other sports to broaden its reach. Its focus is on fostering long-term engagement, intrinsic motivation, and holistic development—moral, mental, and physical. Ultimately, the Sport Academy Methodology (SAM) seeks to educate for life, using sport as a tool for integration, resilience, and community building.

Methodology: To ensure quality, relevance, and adaptability, a structured evaluation tool was created to gather stakeholder feedback during the pilot phase. This tool serves two purposes: (i) to assess the effectiveness and applicability of each module, and (ii) to inform improvements before wider dissemination. Protocol for Validation of SAM. The validation protocol tests the effectiveness, feasibility, and reliability of SAM's data collection tools in Albania, Kosovo, and Montenegro. It involves theoretical review, cultural validation, and pilot testing. After refinement, a final online survey will reach a representative sample across regions, organization types, and sizes. Data analysis will then identify the three most relevant modules in each country. Results: and Conclusion: The SAM methodology provides a robust and adaptable framework for embedding inclusive, evidence-based practices across diverse contexts. Each module addresses physical and psychological needs while promoting broader social goals such as community cohesion, confidence, and lifelong participation in sport. Partner organizations are encouraged to select modules aligned with their target populations, resources, and long-term goals. To support this, an Adaptation Toolkit will be developed and tested. At least three modules per country (Albania, Kosovo, Montenegro – non-associated partners) will be adopted. Project 101183224 – Co-funded by the European Union

Palavras-chave/Key Words: Martial Arts; Social Inclusion; Capacity Building; Grassroots Sport.

Artificial intelligence as a virtual personal trainer: an educational experiment on user experience in the field of motor skills

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Resumo/Abstract:

Background: The integration of artificial intelligence (AI) into health promotion and physical exercise programmes represents one of the most rapidly developing frontiers in technological and educational innovation. However, despite the potential of such tools, the scientific literature still appears limited in terms of studies that evaluate not only the objective effectiveness of these protocols compared to traditional methods, but also users' subjective perceptions in terms of satisfaction and perceived educational value. **Purpose:** The aim of the study is to explore the perception, satisfaction rating and educational value attributed by adults to an integrated personalised exercise protocol, developed and managed by a virtual assistant based on artificial intelligence, with a view to promoting autonomy, digital competence and self-regulation in lifestyle. **Method:** A sample of 52 participants (aged 20-50), who were not professional athletes, were randomly assigned to an Experimental Group (EG) and a Control Group (CG). The EG used a ChatGPT-based virtual assistant for four weeks, designed to deliver a personalised exercise protocol tailored to individual characteristics, goals and progressive feedback. The CG followed a standard protocol of equal volume and intensity during the same period. Data were collected at three points (pre, during and post) using quantitative and qualitative tools. Objective measures included the 6-Minute Walk Test, Countermovement Jump (CMJ), Sit Reach Test and anthropometric parameters (BMI). For the qualitative part, a Likert questionnaire on satisfaction was developed. Analyses included ANOVA for repeated measures with Bonferroni post-hoc and Wilcoxon Signed-Rank Test for qualitative variables. **Results:** After four weeks, the EG showed significant improvements: +7% cardiovascular endurance, +9% explosive strength, +9% flexibility ($p < .001$; $\eta^2_p = .25$). The CG reported only marginal changes. Perceived enjoyment was significantly higher in the GS ($p < .001$). **Conclusion:** The AI-based virtual assistant proved effective in improving physical performance and satisfaction, promoting autonomy and self-regulation.

Palavras-chave/Key Words: Artificial Intelligence; Personalized Exercise; Autonomy and Self-Regulation; User Satisfaction.

Isometric Mid-Thigh Pull (IMTP) testing of physical exercise in artificial way

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Resumo/Abstract:

Background: In modern soccer, understanding an athlete's performance capabilities is essential to design efficient training protocols. Athlete profiling, however, is often costly and time-consuming, requiring multiple tests, equipment, and days of data collection. Among the various performance indicators, strength is considered the fundamental conditional skill. A widely used test to assess strength and power is the Isometric Mid-Thigh Pull, whose outcomes strongly correlate with Squat Jump, Countermovement Jump, and short-distance sprint performance. These assessments are not always accessible across all competition levels. Artificial intelligence could represent an innovative solution, enabling athlete profiling based on minimal input data. Despite the extensive literature on the predictive value of IMTP, no AI-based automated tool currently provides a complete performance profile from a single measurement. **Purpose:** This study investigates the use of AI to predict athletes' KPIs, specifically vertical jump and 10-meter sprint and validate predictions against real performance data. **Method:** A sample of 10 amateur soccer players (average age 21 years; weight 75 kg; height 177 cm) performed the IMTP on Kinvent force platforms. Peak Force results were processed by ChatGPT to generate performance profiles for SJ, CMJ, and 10-meter sprint. Actual data for these tasks were collected and compared with predicted values using Pearson's correlation. **Results:** Predictions for the 10-meter sprint showed the highest accuracy, with a moderate correlation ($r = 0.449$), indicating the model's ability to link explosive strength with acceleration. Conversely, predictions for CMJ and SJ displayed weaker correlations, suggesting the model requires refinement to better estimate vertical jump performance. **Conclusion:** This study highlights the potential of neuromuscular testing with AI for athlete profiling. While the system reliably predicted sprint performance, jump estimations were less accurate. Further research with larger, homogeneous samples and biomechanical and metabolic variables could enhance prediction accuracy, offering coaches and clubs an alternative to traditional profiling.

Palavras-chave/Key Words: Profiling; Performance; Artificial Intelligence.

Inertial Sensor-Based Machine Learning Models for Quantifying Motor Competence in School-Aged Children

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Resumo/Abstract:

Introduction: Motor Competence (MC) in children has been analyzed to assess their overall development. Higher levels of MC have been linked to better physical health and enhanced executive functions. However, the MC is typically based on the outcomes of motor task performance, favoring the results while neglecting the process of execution. Inertial devices have significant applicability and capture data during movement, offering a highly attractive solution for the development of real-time assessment methods that allow the evaluation of the process of motor execution.

Porpose: The aim of this study is to train AI models using data from inertial sensors to predict the level of motor competence in primary school children. **Methods:** The MCA battery was used to assess the percentiles for each component of MC in 188 children (101♀) with decimal ages between 5.44 and 11.30 years old. For each test, an inertial sensor (ICM-20948, InvenSense) was attached to a body segment (leg, trunk, or forearm depending on the nature of the task). AI models were trained for each task, using parameters as height, decimal age, body mass, several statistical tests, sample entropy and Lyapunov exponent from the 3D data collected by the sensor. The predicted variable was the percentile calculated via the MCA method. Random Forest algorithms with parameter tuning were applied. **Results:** The horizontal jump task yielded the highest coefficient of determination (0.57) in the AI model. The AI models for the platform transfer, lateral jumps, and shuttle run tasks demonstrated moderate performance, with R^2 values ranging between 0.38 and 0.47. The models for the kicking speed and throwing speed tasks showed poor performance (0.26 and 0.22). **Conclusion:** Overall, the AI models demonstrated better performance in predicting the stability component (horizontal jump and platform transfer), moderate performance for the locomotor component, and lower performance for the manipulative component.

Palavras-chave/Key Words: Motor Competence; Children; Inertial Sensors; AI Models,

The Influence of Running Demands in Hamstring Injury in Elite Male Soccer Players. A Comparison Between Injured and Uninjured Players

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Resumo/Abstract:

Introduction: Injury analysis is a current trend topic in sports performance. **Purpose:** The study aim was to compare the loading patterns of high intensity running and sprint distances in an elite soccer club. Specifically, the study compared any over- or under-loading in the four weeks preceding hamstring injury between injured and uninjured players. **Methods:** Thirty professional outfield soccer players from an English Premier League club participated in the study (age 24.2 ± 6.1 years, weight 74.7 ± 7.8 kg, height 1.81 ± 0.09 m). Training and match data from the complete 2020/21 season was considered for analysis in which injury information was collected. An 18Hz Global Positioning System (GPS) technology tracking system was used to collect total distance, high-speed running distance (total distance covered of 5.5 - 7m/s) and sprint distance (total distance covered > 7 m/s). Afterwards, the relative and absolute measures of previous metrics were calculated and used for analysis. These metrics were analyzed considering the four-hamstring injury preceding weeks (-4, -3, -2, -1). **Results:** The main findings result showed that sprint distance per minute was higher in injured than uninjured players in the week -1 ($p = 0.038$; $ES = -0.89$). No other meaningful differences were found. This study highlights the impact that sprint distance per minute displayed in the week preceding injury may have on hamstring injury in elite English Premier League players. Such findings reinforce the importance of longitudinal data collection, especially related with sprint distance while the analysis of two, three- and four-weeks prior injury seems not to be adding significant value. In addition, the importance of analysing relativized data (per minute) over the absolute data was emphasised. Nonetheless, more studies are needed to confirm the present results.

Palavras-chave/Key Words: External load; Football; Hamstrings; Relative Data; Sprinting

24-Hour Behavior and Physical Functionality in Active Older Adult

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Resumo/Abstract:

Objective: This study aimed to analyze the association between 24-hour behavior components: sleep, sedentary behavior (SB), and moderate-to-vigorous physical activity (MVPA), and various physical functionality indicators in active older adults. **Methods:** The sample included 134 participants (mean age 71.6 years; 91% female). Data collected encompassed average daily sleep hours, sedentary time, MVPA, and five physical functionality measures: gait speed, Timed Up and Go (TUG) test, 5-times sit-to-stand test, Step test, and handgrip strength. Pearson correlations and multiple linear regressions adjusted for age, sex, and body mass index (BMI) were performed. **Results:** Adjusted regression analyses identified age and BMI as significant predictors of physical functionality, showing negative associations with gait speed (age: $\beta = -0.367$, $p = 0.001$; BMI: $\beta = -0.379$, $p = 0.001$) and handgrip strength (age: $\beta = -0.374$, $p = 0.001$; sex: $\beta = 0.535$, $p = 0.001$). While 24-hour behavior components showed no statistically significant associations with physical functionality outcomes, weak but significant correlations were found between gait speed and handgrip strength ($r = 0.300$, $p = 0.001$), and between gait speed and TUG ($r = -0.308$, $p = 0.001$). **Conclusion:** Sociodemographic variables such as age, sex, and BMI better explain variations in physical functionality than isolated 24-hour behavior components. These findings highlight the multifactorial nature of physical functionality in older adults and emphasize the need for comprehensive intervention strategies targeting demographic and behavioral factors to promote healthy aging.

Palavras-chave/Key Words: Aging; Body mass index; Physical activity; Fitness; Sedentary behavior

Women's Power Network - Promoting and Empowering Healthy and Active Lifestyles of Women Across the Life Cycle

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Resumo/Abstract:

Although females constitute approximately 50% of the European population, sex inequality is well-documented in research on physical activity, exercise, and sport sciences, particularly in terms of female representation. There are knowledge gaps in areas such cardiovascular and musculoskeletal health, mental and metabolic health, menstruation and menopause, pregnancy and postpartum physiology and lactation research, among other sex-specific issues; We noticed the exclusion of disabled, low income and other vulnerable female populations in both research trials and exercise interventions; We noticed the limited use of technological innovations for assessing, applying and enhancing exercise programs in female populations. There is a lack of consolidated research information needed for designing optimal, feasible, and effective exercise programs for various target female groups. The general objective of the WOMEN'S POWER project is to prepare a European Cooperation in Science and Technology (COST) Action to establish a sustainable network that will foster evidence-based research, open resources, digital-based solutions, and socially-inclusive programs to promote healthy and active lifestyles during the female specific cycle of life, to empower girls and women, as well as healthcare and exercise professionals. A COST Action is an interdisciplinary research network that brings researchers and innovators together to investigate a topic of their choice for 4 years. The project's results will inform decision-making and optimize the delivery of multidisciplinary educational and healthcare services across various economically, socially, and environmentally sustainable settings.

Palavras-chave/Key Words: Women; Girls; Physical activity; Exercise; Fitness

Educating for the Future: Megatrends and Higher Education in Physical Activity and Sport

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Resumo/Abstract:

Objectives: This presentation explores how higher education programs in sport and physical activity - including university-level programs focused specifically on physical education - could evolve to address a set of emerging megatrends. These trends include digital transformation, interdisciplinary collaboration, cultural competence, health promotion across the lifespan, and sustainability. Each of these developments influences the professional roles that future graduates will assume in supporting inclusive and socially impactful physical activity. **Methods:** Instead of presenting empirical findings, this presentation provides a conceptual framework to guide forward-thinking curriculum development. While current programs may vary significantly across national and institutional contexts, there is growing awareness that the competencies required of graduates may be shifting. For instance, digital technologies - including artificial intelligence - are becoming increasingly integral to health and sport settings, and professionals are expected to work across sectors and engage with culturally diverse populations. Additionally, promoting physical activity across all stages of life and integrating sustainability goals into educational content are becoming essential aspects of the field. **Results:** The presentation suggests potential directions for curriculum development in response to these trends. These include enhancing opportunities for interdisciplinary collaboration, incorporating digital literacy across modules, utilizing case-based teaching to develop cultural competence, and ensuring that students address issues of inclusion, equity, and sustainability throughout their studies.

Conclusion: Framed around the concept of the “T-shaped professional” - combining disciplinary depth with the ability to work across fields - these suggestions aim to stimulate reflection and dialogue on how higher education can contribute to a more socially responsive future for physical education and sport science.

Palavras-chave/Key Words: Physical education; inclusion; sustainability; megatrends; higher education

User Insights on Mobile Apps for Physical Activity During and After Pregnancy

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Resumo/Abstract:

Perceive mobile applications aimed at promoting active lifestyles, especially among populations with specific needs, this study sought to understand how pregnant and postpartum women use and perceive mobile applications aimed at active lifestyles. To this aim, a digital questionnaire entitled “Active Pregnancy App” was administered. The instrument comprised 36 items and was disseminated via the Google Forms platform. A total of 235 pregnant and postpartum women participated in the study, ranging in age from 24 to 52 years. All participants had given birth between 2021 and 2023. Although 80 per cent of the participants practiced physical activity during pregnancy (mainly walking), only 13 per cent used specific apps for this period, while 53 per cent used generic fitness apps. In the postpartum period, physical activity fell to 63 per cent, with 37 per cent of women not exercising at all. Participants placed great value on the creation of a specific app for pregnancy and postpartum, highlighting desired features such as access to up-to-date recommendations on health and exercise, the possibility of recording clinical and training parameters, interaction with health and exercise professionals, and programmes adapted for home, outdoors and postpartum recovery. The suggestions gathered points to the need for a simple, accessible app, personalized to each woman's conditions, with exercise videos, motivational reminders and integration with monitoring devices and social networks. Some participants expressed concerns about replacing human contact. The study concludes that there is a significant gap in the market for apps specifically for this audience, and that an app developed based on these preferences could be a valuable tool for promoting maternal health. The research reinforces the importance of involving users and professionals in the creation of effective and safe digital solutions.

Palavras-chave/Key Words: Exercise; Health; Technology; Lifestyle; Special phase of life

Sleep and recovery analysis in elite canoe athlete: A Longitudinal Case Study

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Resumo/Abstract:

Sleep quality and recovery monitoring are crucial factors in elite performance. Wearable technology provides continuous physiological data that can inform training periodization and performance strategies in high-level sport. This study analysed sleep patterns and recovery metrics in an elite canoe athlete across different training and competition phases. A case study was conducted using continuous monitoring with a Whoop device to track sleep duration, sleep quality, and heart rate metrics in an elite canoe athlete from the Portuguese national team (1.89m, 91kg). Data was collected across distinct phases including training periods (March) and international competition phases, culminating in the Paris 2024 Olympic Games (August). March training period demonstrated optimal sleep indicators, with an average total sleep time of 7h14, 1h33 of deep sleep (SWS), 2h27 of REM and a recovery average of 54%. In August (Olympics), the athlete recorded 6h51 of total sleep average, 1h30 of SWS, 1h33 of REM and 59% recovery average. In September (World Championships), 6h44 total sleep average, 1h18 SWS, 1h31 REM, and 56% recovery. This paradoxical finding suggests that recovery metrics reflect multifactorial physiological adaptations beyond sleep quantity alone. The study highlights the complex relationship between sleep quantity and recovery. The enhanced recovery scores during competition, despite reduced sleep, suggest favorable physiological adaptations that may optimize sleep efficiency. Continuous monitoring provides insights to identify performance trends and risk periods. These findings emphasize the multifactorial nature of recovery assessment in sport contexts and suggest that sleep efficiency may be more important than sleep quantity during peak competition periods.

Palavras-chave/Key Words: Sleep; Recovery; Canoe athlete; Wearable technology

From Awareness to Action: Rethinking Anti-Discrimination Education Through Sport

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Resumo/Abstract:

This presentation shares findings and reflections from a multi-phase project evaluating and redeveloping a sport-based anti-discrimination education programme in Ireland, delivered by Sport Against Racism Ireland (SARI). The work began with an evaluation involving over 4,700 feedback forms from students and teachers, as well as interviews and direct observations. While the original workshops were clearly successful in engaging young people and generating awareness of individual behaviours related to discrimination, they fell short in provoking deeper reflections on privilege, power, and structural injustice.

In response, we co-developed an expanded toolkit aimed at improving the pedagogical coherence and long-term impact of the programme. This revised resource emerged through a consultative process with SARI facilitators, schoolteachers, academic experts, and students themselves. Drawing on their feedback, the new toolkit integrates principles of experiential learning and inclusive facilitation, while extending the scope of reflection beyond personal attitudes to systemic dynamics. Activities such as the “Captain’s Game” are now framed more explicitly around exclusion, allyship, and the social rules that reproduce inequality—without abandoning the play-based, accessible nature of the original design.

This presentation offers two key takeaways. First, it introduces the revised toolkit as a practice-oriented framework for educators and community workers committed to anti-discrimination work through sport. Second, it opens up a methodological and pedagogical discussions around how we evaluate and design anti-discrimination education that moves beyond mere awareness and towards fostering systemic awareness, particularly among young learners.

Palavras-chave/Key Words: Discrimination, Racism; Sexism; Sport for development; Experiential learning

Comparisons Between Sex for Physical Fitness and Body Composition Markers in Badminton Players from the Portuguese National Team

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Resumo/Abstract:

Badminton is a complex sport influenced by multiple performance factors. According to the literature, the most relevant characteristics for success in badminton are technical skill, physical fitness, and body composition. However, there are differences in the previous markers between sex. This study aimed to compare various fitness and body composition markers between sex of athletes from the Portuguese National Badminton Team. Ten female (age, 23.4±3.0) and 13 male (age, 21.2±3.6) elite Portuguese badminton players were evaluated in agility, body composition, lower limb power, and cardiovascular endurance. The assessments were conducted over four days during a national team training camp. The main results showed higher values for male athletes in cardiovascular endurance ($p = 0.001$), lower limb power ($p = 0.001$), upper limb power ($p = 0.001$), height ($p = 0.001$), skeletal muscle mass ($p = 0.007$), total body water ($p = 0.010$), lean muscle mass: of right arm ($p = 0.023$); left arm ($p = 0.017$); right leg ($p = 0.006$), left leg ($p = 0.005$); and trunk ($p = 0.018$). In addition, there were lower values for male athletes in agility ($p = 0.001$), body mass index ($p = 0.005$) and fat mass ($p = 0.001$). These findings suggest that sex has a major role when analysing physical fitness and body composition markers. As theoretically expected, male showed better results when compared with female athletes.

Palavras-chave/Key Words: Badminton; Fitness; Sports Performance

COL.D.D.: The European Intervention Promoting Mental Well-Being and Social Inclusion in Older Adults through Mindfulness and Cold-Water Immersion

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Resumo/Abstract:

The initiative, carried out across five European countries (Italy, Austria, Belgium, Croatia, and the Czech Republic), produced three core steps aimed at building capacity and fostering community-level implementation: Prior to the pilot workshops, a pre-post assessment protocol was carried out to quantitatively measure changes in depression, anxiety, and executive functioning using standardized psychometric instruments. Initial results indicate reductions in emotional distress and perceived improvements in cognitive abilities, particularly among middle-aged participants. Currently, the consortium is preparing a scientific publication to disseminate these preliminary findings, aiming to contribute to the international literature on preventive mental health interventions for older populations.

Future dissemination efforts aim to scale these tools across broader community networks, contributing to active aging strategies within the EU mental health and social care frameworks.

Palavras-chave/Key Words: Healthy aging; Mindfulness; Cold hydrotherapy

Pan-European Evaluation of Antidoping Content Presence in Undergraduate Sport Program Curricula

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Resumo/Abstract:

Introduction: Antidoping academic training is essential in preparing competent sports professionals, yet a systematic evaluation of its integration in European undergraduate sport curricula remains largely unexplored. **Objectives:** This study aimed to conduct the first comprehensive pan-European assessment of antidoping content in undergraduate sports programs, identifying explicit and implicit inclusion of antidoping academic training.

Methods: The study analyzed 1,202 undergraduate sport-related degree programs across 581 universities in 44 European countries. Data collection involved systematic keyword searches within official online curriculum resources, identifying explicit course titles mentioning "doping" and implicit inclusion through related disciplines. Actor-Network Theory (ANT) was used to examine enrolment and involvement processes of the academic community in antidoping efforts. **Results:** Significant inconsistencies were identified: only 113 programs explicitly contained courses with the term "doping" in their title, while 216 programs indirectly included antidoping content through disciplines like sports law, sports medicine, sociology, and nutrition. This fragmentation highlights a disconnect between advanced antidoping research and foundational educational practices. **Conclusion:** The study underscores the gap between active antidoping research visibility and the lack of corresponding undergraduate teaching. It identifies critical misunderstandings regarding antidoping content, highlighting the polysemy of terms like "education". Expectations from antidoping institutions often conflict with university logic, creating an illusion of consensus without effective implementation. Universities must clarify their educational objectives, emphasizing critical thinking over moral indoctrination. The discrepancy between public declarations like "working together for clean sport" and actual educational practices is highlighted. Further research involving detailed interviews with educators is needed to refine curricula understanding and expand the inquiry to master's programs and medical schools. This study aims to build international collaborations under the UNESCO Anti-Doping Chair.

Palavras-chave/Key Words: Antidoping Education; Undergraduate Sports Programs; European Higher Education; Curriculum Evaluation; Actor-Network Theory

Teaching swimming for understanding: traditional or contemporary learning methods based on multiteaching styles?

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Resumo/Abstract:

A student-centred approach is widely used in team sports, and further examples are needed to apply it to swimming teaching. Different approaches can be used, and the game is the vehicle through which understanding and motor competence are linked. A proper dosage of stimuli, involvement, inclusion, fair play, and sport as a means of self-knowledge and self-awareness leads to educational success. The present research analysed swimming instructors' personal (such as empathy and self-control) didactical and methodological competencies, investigating the relationships between them and the swimming course children's aquatic competencies and self-perception. A sample of 200 children (94 females and 106 males, aged 6.0 ± 1.7) and 44 swimming instructors were enrolled. Children's aquatic competence and their self-perception were assessed through two Pictorial Scale of Perceived water competence. The instructors' group self-reported the perception of which teaching styles they used through the Teaching Styles questionnaires. Three lessons for each child group were video-recorded and analysed using the Internship Evaluation Sheet in Physical Education and Sports, the System for Observing Fitness Instruction Time, and the Instrument for Identifying Teaching Styles. Moreover, the Empathy Scale for Teachers and the Self-control scale were used to assess Instructors' personal competencies. The results emerging from the Teaching Style Questionnaire are confirmed and integrated by video analyses, highlighting a prevalent mono-teaching pedagogy with a mostly linear teaching style focused on command and practice styles. The questionnaires analysing the empathy and self-control of the instructors have highlighted the positive personal skills of the instructors. A discrepancy between children's aquatic competence and their perception is highlighted by an overall low to medium level of competence and an overall medium to high value of their perception. Instructors using multi-teaching approach highlighted direct correlations with teaching effectiveness, empathy capacity, and noticeable relationships with children's actual and perceived aquatic competence.

Palavras-chave/Key Words: Aquatic perceived and actual motor competence; system thinking; method-logical competences; didactical competences; instructors' training, dose-response

Fear of Falling as a Mediator between Sarcopenia and Quality of Life in Older Portuguese Adults

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Resumo/Abstract:

Introduction: Fear of falling (FoF) is a common psychological consequence of musculo-skeletal conditions like sarcopenia, negatively impacting quality of life (QoL) in older adults (Beaudart et al., 2023; Marconcin et al., 2025). **Objectives:** This study aims to examine the associations between sarcopenia, FoF, and QoL in older adults, as to explore the mediating role of fear of falling in this relationship. **Methods:** This cross-sectional study included 58 older adults aged over 65 years (Mage = 72.5±6.3 years; 66.1% female) from Beja (Portugal), who were recruited through UP AGAIN SENIOR Multicomponent Exercise Program. Sarcopenia, FoF, and QoL were assessed using the SARC-F, FES-I (Figueiredo Santos, 2017; Yardley et al., 2005) and SF-12 (Silveira et al., 2013; Ware et al., 1996) questionnaires, respectively. Statistical analyses included descriptive statistics, Spearman correlations, and mediation analysis using PROCESS macro (Model 4) by Hayes (2012), controlling for age and sex, conducted with IBM SPSS version 29.0. **Results:** The mean score of SARC-F, FES-I and physical and mental components QoL were 0.90±1.18, 23.76±8.40, 18.25±2.11 and 21.66±2.32, respectively. A higher sarcopenia score was significantly associated with greater FoF ($r=0.381$, $p=0.003$) and lower physical QoL ($r=-0.537$, $p=0.001$). The results shows that sarcopenia was a significant predictor of FoF ($\beta=2.24$, $p=0.019$; 95% CI [0.39, 4.10]; however FoF did not mediate the relationship between sarcopenia and QoL, either in the physical (indirect effect $\beta=-0.024$; 95% CI [-0.39, 0.18]) or mental component (indirect effect $\beta=0.011$; 95% CI [-0.30, 0.22]). **Conclusions:** Sarcopenia is linked to greater FoF and poorer physical QoL, but FoF does not mediate the relationship between sarcopenia and QoL. Early sarcopenia detection may help prevent FoF and enhance confidence in daily life.

Palavras-chave/Key Words: Frailty; Fall risk; Healthy ageing; Well-being; Mental Health

The Rise of Anterior Cruciate Ligament Injuries in Male Football Players: A Systematic Review on the Impact of Competitive Match Congestion

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Resumo/Abstract:

This review aims to analyze the presence of Anterior Cruciate Ligament (ACL) injuries among male football players in professional and semi-professional contexts, exploring the potential relationship with increasingly congested competition schedules. The studies used in this review were found on the Pubmed database, using the keywords “soccer”, “injuries”, “male”, “ACL”, “calendar”, and “load”. The criteria to be included in this review was articles published between 2015 and 2025 and articles published in peer reviewed journals. Articles that were systematic reviews were also removed. In total three studies were analyzed for this review. The results reveal a significant association between congested calendars and a higher occurrence of injuries, suggesting that accumulated physical stress and neuromuscular fatigue impair movement quality and elevate injury risk. However, we didn't find a direct link between an increase in ACL injuries specifically in moments of increased match and training load. This evidence underscores the importance of monitoring training and match loads, as well as implementing more field studies in order to guarantee better prevention and recovery of injuries in order to safeguard athletes' physical integrity and optimize their performance throughout the season.

Palavras-chave/Key Words: ACL; Soccer; Matchload; Prevention; Injuries

The Impact of Coronary Artery Bypass Grafting on Respiratory Function: A Systematic Review

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Resumo/Abstract:

Cardiovascular diseases are the main cause of mortality and morbidity in Portugal, with coronary artery bypass grafting being one of the most performed surgeries by cardiothoracic centers. After cardiac surgery, patients often experience a decrease in physical capacity, which results in a decline in respiratory function and increases the risk of mortality or hospitalizations expenditure. The objective of this systematic review was to characterize changes in respiratory function in patients undergoing coronary artery bypass grafting. A reduction in respiratory function following cardiac surgery was hypothesized. This systematic review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA). Web of Science, Pubmed, SCOPUS, and Sport Discus were searched using a predefined research strategy to identify relevant original studies published, without time limitations, until March 2025. To be included, studies must have assessed adult patients submitted to elective coronary artery bypass grafting who evaluated the respiratory function before and after cardiac surgery. Studies that reported other types of cardiac surgery were excluded. The Newcastle Ottawa-Scale and the Cochrane risk-of-bias tool for randomized trials (ROB 2) were used to analyze the risk of bias of the selected studies. After screening 1184 potential articles, six studies met the inclusion criteria. Studies included participants with coronary artery bypass grafting ($n = 229$), with ages between 54 and 67 years. All included studies reported significant postoperative reductions in respiratory function following coronary artery bypass grafting particularly in forced vital capacity and forced expiratory volume in one second. This systematic review highlighted the changes in pulmonary function following coronary artery bypass grafting, enhancing a postoperative reduction in respiratory muscle strength.

Palavras-chave/Key Words: Pulmonary function; Respiratory muscle strength; Health outcomes; Coronary artery bypass grafting

Elementary school self-reported physical activity during school time and free-time: Exploratory study

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Resumo/Abstract:

Out-of-school PA engagement requires an intervention program (Manios et al., 1998; Verstraete et al., 2007), but more work is needed to develop Physical Education (PE) interventions that also impact outside-school activity (Errisuriz et al., 2018). Self-report of physical activity (PA) is frequently used (Caballero et al., 2003; Sacchetti et al., 2013; Verstraete et al., 2007). Recently, a pictorial questionnaire was validated for Portuguese children (Mercê et al., 2023). Objective: To analyse PA perception of Portuguese basic school students, during PE and out-of-school time. Method: Sixty children ($6,32 \pm 0,54$ years, 29 girls), from 2 public schools of 2 medium dimension cities (rural-urban transition), completed an in-person pictorial questionnaire, with support of trained experimenters. Parents informed consent and children assent were obtained. Results: No gender or age differences were found. Direct associations were found between class-break time and weekend ($\rho = 0,434$, $p = 0,001$ IC, 195,625), out-of-school and weekend ($\rho = 0,502$, $p = 0,001$ IC, 278,675), and class-break time and PE ($\rho = 0,264$, $p = 0,041$ IC, 003,491). The highest PA perception was in PE ($3,9 \pm 0,35$), followed by days of the week ($3,72 \pm 0,64$), class-break time ($3,6 \pm 0,83$), out-of-school ($3,12 \pm 1,22$), and weekend ($2,75 \pm 1,32$); with significant difference among these moments ($X^2 = 63,322$, $p = 0,001$). Weekend was significantly outperformed by all of the other moments; as also out-of-school. Only class-break time was not significantly different from days of the week. All remaining comparisons were significantly different. Discussion: Class break time is essential for PA, maybe because of social free play affordability, that may be absent or difficult during out-of-school and weekend moments. Nonetheless, it seems that PE' didactics requires an interdisciplinary and articulated approach, inside and outside school, to be an instrument for PA habits with parental involvement.

Palavras-chave/Key Words: Physical education; didactics; physical activity; free play; basic school

Free play and body mass index in Portuguese basic school children' self-reported physical activity: Exploratory study

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Resumo/Abstract:

As a predictor of PA, is necessary to promote motor competence for children with high body mass index (BMI) (Spessato et al., 2013; Valentini et al., 2020). Play activities alone or complemented with PE significantly augments PA (Pangrazi et al., 2003). Self-report is an instrument for children' PA (Caballero et al., 2003; Sacchetti et al., 2013; Verstraete et al., 2007). Mercê et al. (2023) validated a PA self-report pictorial questionnaire, for Portuguese children. Objective: To analyse the association of PA perception with BMI and free play. Method: Ninety-two school children ($6,59 \pm 0,49$ years, 47 girls), from 2 public schools, of 2 medium dimension cities (rural-urban transition), completed an in-person pictorial questionnaire, with support of trained experimenters. Parents informed consent and children assent. Results: No gender differences were found. Inverse association was found between BMI and PA perception during PE ($\rho = -0,213$, $p = 0,041$ IC $-0,406$ $-0,003$). Direct associations were found between days of the week and weekend ($\rho = 0,438$, $p = 0,001$ IC $0,250,594$), weekend and out-of-school ($\rho = 0,357$, $p = 0,001$ IC $0,158,528$), class-break time and PE ($\rho = 0,211$, $p = 0,044$ IC $0,000,404$), and, out-of-school and PE ($\rho = 0,239$, $p = 0,022$ IC $0,030,428$). Highest PA perception was in PE ($3,64 \pm 0,62$), followed by class-break time ($3,41 \pm 0,83$), days of the week ($3,32 \pm 0,95$), weekend ($2,73 \pm 1,12$) and out-of-school ($2,67 \pm 1,04$); with significant difference among these moments ($X^2 = 83,923$, $p = 0,001$). Weekend and out-of-school were significantly outperformed by all of the other moments. No significant difference occurred between class-break time from days of the week, and between out-of-school and weekend. All remaining comparisons were significantly different. Discussion: PE and class-break time are essential for PA, maybe because of PE' didactics and free play affordability, less likely to occur during out-of-school and weekend, due to social and urban organization. Children with higher BMI, free play may afford inclusion for higher PA.

Palavras-chave/Key Words: Physical education; Didactics; Free play; Physical activity; Kinanthropometry

Laterality and intrasegmental coordination in 9-10 years old coin transfer task

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Resumo/Abstract:

Background: Fine motor skills are essential in educational settings and everyday activities, underpinning the ability to perform tasks that require precision, dexterity, and refined motor coordination. There are tasks in which both hands are required, such tying knots or using an instrument. The present study aimed to analyze and compare intrasegmental coordination of the dominant and non-dominant hands, during the Coin Transfer (CT) task. **Methods:** Three children ($M=9.67\pm0.47$ years; $\text{♀}=1$; 1 lefthanded), performed the transfer coin task, from the MABC-2, sequentially transferring 12 coins between two containers, using only the pincer grasp movement. Angular velocity data was collected using an inertial sensor placed on the index finger. Motor coordination was assessed using phase plots based on angular velocity and displacement data for the three planes of movement. **Results:** In all children, the dominant hand showed greater fluidity and less dispersion in the plot' tracings, indicating a more efficient motor pattern. There was greater stability in the frontal plane (abduction/adduction movements), regardless the hand used. In the sagittal plane (flexion/extension), there was greater variability and less fluidity, especially with the non-dominant hand. **Conclusions:** The results suggest that, at these ages, for pincer grasp, intrasegmental coordination is superior in the dominant hand, showing greater efficiency in movements and less variability during the task's execution. The difference between hands highlights the difference of hands use in the practice of fine motor skills. Considering the importance of bilateral fine motor actions in many activities, such as, learning to use musical and sport instruments, these data reinforce the importance of promoting bilateral motor experiences, in the educational context, to afford the balanced development of hands' fine motor skills.

Palavras-chave/Key Words: Fine motor coordination; laterality; MABC-2; inertial sensors; motor development

Perceived quality and loyalty intention in fitness group activities

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Resumo/Abstract:

Instructor's quality intervention in group activities (GA) is recognized as a key determinant of participants' experiences and their continued engagement (loyalty) within fitness settings. With that, this study aimed to (i) describe and compare participants' perceptions of instructor behaviour quality across four GA (BODYBALANCE™, Indoor Cycling, Strength and Conditioning, Zumba®), and (ii) examine the association between participants' perceived quality and their loyalty intention. The sample comprised 153 GA participants aged between 18 and 70 years ($M \pm SD = 42.88 \pm 12.03$). Data was collected by a shortened and adapted version of QIF-AG questionnaire, evaluating 10 indicators of GA instructor quality along with loyalty intention. Descriptive statistics ($M \pm SD$), one-way ANOVA for between-activity comparisons, and Pearson correlation coefficients for variable associations were computed. No significant differences in perceived quality emerged between different GA. However, positive and consistent correlations were identified between the perceived instructor GA quality and participants loyalty intention, particularly regarding image, good mood, sympathy, motivation, and knowledge. Findings emphasize the crucial influence of instructors in shaping participant satisfaction and loyalty intentions within GA contexts and underscore the need to incorporate the relational and interpersonal skills development in instructor training and evaluation processes.

Palavras-chave/Key Words: Perceived quality, Instructor, Fitness group activities, Satisfaction, loyalty

Effects of a structured exercise program on psychosocial and physical indicators in women with substance use disorder

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Resumo/Abstract:

Women recovering from substance use disorder (SUD) often encounter multifaceted challenges, including elevated stress sensitivity, limited coping strategies, and social disconnection, all of which elevate the risk of relapse. Physical exercise has emerged as a valuable complementary approach to enhance psychological resilience and overall well-being in this population. This study explored the potential of a structured physical exercise intervention program (PROMETE) to reduce perceived stress, improve physical fitness, and promote resilience and social connectedness among women in SUD recovery. Quasi-experimental single-group pretest-post test design was implemented. Prior to the intervention, a content analysis of participants' narratives informed the customization of the program. Fifteen women took part in the intervention, with assessments conducted before and after, using the Perceived Stress Scale and physical fitness tests (handgrip strength and flexibility). Results indicated a significant reduction in perceived stress and notable improvements in muscular strength and flexibility. Findings reinforce existing evidence on the benefits of exercise in regulating stress and promoting recovery in vulnerable groups. PROMETE program illustrates the effectiveness of participatory, multidimensional physical activity interventions in supporting recovery among women with SUD. Incorporating structured physical exercise into comprehensive recovery strategies may foster resilience, enhance social reintegration, and support long-term recovery outcomes.

Palavras-chave/Key Words: Substance use disorder; Women's recovery; Physical exercise; Physical fitness, Perceived stress

Effects of Hypnosis and Post-Hypnotic Suggestions on the Execution of Ballistic Movements in Combat Sport Athletes

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Resumo/Abstract:

This experimental study examined the effects of hypnosis and post-hypnotic suggestions (PHS) on the execution of ballistic movements in combat sport athletes. Ballistic actions such as punches and kicks require rapid, explosive movement patterns with high levels of neuromuscular coordination and attentional control. Thirty athletes (aged 18–40), practicing karate or taekwondo for at least two years, were randomly assigned to two groups: experimental (hypnosis + PHS; $n = 15$) and control (guided relaxation; $n = 15$). All participants were assessed at baseline (T0), immediately after intervention (T1), and after 24 hours (T2). Performance was evaluated based on movement velocity, accuracy on a standardized target, and surface EMG readings of key muscles. Psychological measures included anxiety, self-confidence (CSAI-2R), and flow state assessments. The hypnosis protocol included progressive induction, suggestions for focus and confidence, and a post-hypnotic verbal cue ("precise impact"). The control group engaged in a neutral relaxation session with breathing and imagery exercises. Results showed that the experimental group demonstrated statistically significant improvements in execution speed (from 5.2 to 5.8 m/s; $p .01$), accuracy (from 7.5 to 8.8 out of 10; $p .001$), and reduced EMG activation latency (–14%; $p .05$). Flow and attentional focus scores also increased ($p .01$). No significant changes were observed in the control group. These findings suggest that hypnosis combined with PHS can enhance motor performance in combat sports through improved cognitive and neuromuscular integration. The short-term retention of effects observed at T2 highlights the practical potential of incorporating hypnosis in athletic training. Further research with larger samples and longitudinal designs is recommended to validate these preliminary findings.

Palavras-chave/Key Words: Hypnosis; Post-hypnotic suggestions; Ballistic movements; Martial arts; Motor performance; Flow state; Attentional focus

A preliminary proposal for assessing physical fitness in university students through European Fitness Badge

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Resumo/Abstract:

University students are increasingly affected by sedentary behaviors and low levels of structured physical activity. Despite the recognized importance of fitness for academic performance and long-term health, Romanian higher education institutions lack a standardized, scalable, and motivating system to assess physical fitness across disciplines. This study aimed to explore the feasibility and potential benefits of introducing the European Fitness Badge (EFB) as a recommended framework for assessing physical fitness in Romanian university students. The proposed approach highlights the EFB as an accessible, easy-to-administer, and feedback-driven tool that could be used within university settings to evaluate and raise awareness about students' physical fitness. A cohort of 180 students, aged 18 to 53 years, participated in a pilot implementation of the EFB protocol. The test battery included standardized assessments of endurance, strength, flexibility, and coordination. Students completed a pre-screening questionnaire (PAR-Q), followed by field-based tests (e.g., Step Test, Planking, Flamingo Balance, Sit Reach) conducted during academic hours. Data were analyzed descriptively and comparatively based on the sex and academic background. The preliminary results indicated clear differences in performance between physically active and inactive students, as well as males and females, particularly in strength and coordination components. The EFB also proved to be efficient in identifying students at potential health risk based on body composition and motor function. This preliminary evaluation supports the integration of EFB as a regular monitoring tool in Romanian universities. Beyond assessment, the structured feedback provided by EFB can enhance motivation, guide interventions, and support a campus-wide culture of physical activity and health promotion. Further research is recommended to validate these findings longitudinally and to expand implementation at the national and European level.

Palavras-chave/Key Words: European Fitness Badge; Physical fitness; Body composition; university students; Health

Running for Health: Behaviours, Motivations and the Role of Technology and Commerce in Promoting Physical Activity

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Resumo/Abstract:

Introduction: Running is among the most popular forms of physical activity globally, contributing to individual health and well-being. Understanding runners' habits, preferences, motivations, and their engagement with technology and commercial products is essential to inform strategies for health promotion. **Objectives:** This study aimed to describe the running behaviours, trail distance preferences, motives, and technological and commercial engagement of recreational runners, and to explore how these factors relate to health perceptions and active lifestyles. **Methods:** A cross-sectional online survey was conducted among 614 adult runners (29.5% female, 70.5% male; mean age 36.3 ± 12.4 years) in Portugal. The questionnaire included sociodemographic characteristics, running habits, preferences, motives to start and maintain running, health self-perception, and use of technology and spending on running-related products. **Results:** Most participants reported high levels of physical activity: 41.9% train 3 to 5 hours per week, and 43.5% competed in between 1 and 5 events in the last year. A preference for outdoor running (87.6%) and trail running (65.8%) was evident, with 38.6% preferring short-distance trail runs (up to 21 km). Motivations included exercise (19.8%) and pleasure (18.9%) for initiation and staying in shape (12%) for maintenance. The majority considered themselves healthy (80%) and satisfied with their own weight and fitness. Technology played a central role: 56.7% used GPS watches, 74.4% registered online for races, and 67.7% shared experiences on social media. Commercial involvement was substantial, with nearly 30% spending €90 to €110 on footwear and more than a quarter spending €100 to €200 on apparel. **Conclusion:** Recreational running is characterized by strong preferences for outdoor and trail contexts, significant technological engagement, and considerable commercial investment. These factors should be considered when developing health promotion interventions that leverage runners' motivations and behaviours to maintain active lifestyles.

Palavras-chave/Key Words: Running behaviour; Trail running; Technology use; Physical activity; Health promotion

Body Composition, Motor Competence and Physical Fitness in U-15 Soccer Players: Relationship with Physical Activity

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Resumo/Abstract:

Introduction: The regular practice of physical activity (PA) during adolescence is associated with various health benefits, including improvements in body composition (BC), motor competence (MC) and physical fitness (PF). In soccer these variables are valued as they contribute to the performance and progression of young athletes. Higher levels of PA support gains in muscle mass, motor proficiency, and cardiorespiratory endurance, fostering a physical and motor profile better suited to the sport. **Objectives:** To analyze the associations of the PA's levels with BC, MC and PF, in U-15 soccer players. **Methodology:** 22 U-15 soccer players boys (13.67 ± 0.67 years), from central Portugal. BC was assessed according to ISAK protocol, with the estimation of BMI, muscle mass, and morphological type. MC was assessed using the MC Assessment battery, PF through FitEscola, and the PA's levels through the Pictorial Questionnaire of PA in Children and Young People. **Results: and Discussion:** PA is negatively associated with the waist/hip ratio ($r = -0.493$; $p = 0.023$), meaning that more active players tend to have more pronounced waist relative to hip. PA is positively associated with the mesomorphic component ($r = 0.573$; $p = 0.007$), and with muscle mass ($r = 0.549$; $p = 0.010$), indicating that more active players have greater physical robustness. No associations were found between PA's levels and MC. Regarding the PF's tests, an inverse association occurred with the speed test ($r = -0.475$; $p = 0.030$), indicating that the higher the PA's level, the faster the players tend to be; in accordance with the football' rule constraints for this age group, requesting short bursts of high-intensity effort (i.e., speed-based activities). **Conclusion:** The results highlight the influence of PA's level on BC and PF, but not on MC, reinforcing the importance of promoting an active lifestyle in youth soccer for both performance and health, without constraining or affording the development of motor proficiency.

Palavras-chave/Key Words: Football, Kinanthropometry, Motor development, Fitness, Sport formation

Satisfaction with Social Support and Life Satisfaction Among Sports Coaches: A Cross-Sectional Study in Portugal

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Resumo/Abstract:

Introduction: Life satisfaction is a key indicator of psychological well-being and health promotion. Among sports coaches, perceived social support plays a vital role in stress regulation and occupational balance. However, its association with overall life satisfaction remains underexplored. **Objectives:** This study aimed to examine the relationship between satisfaction with social support and life satisfaction among Portuguese sports coaches and to analyse whether coaching qualifications are associated with these constructs. **Methods:** A total of 461 sports coaches (80.3% male) with a median age of 45 years (Mdn = 45, IQR = 17; Q1 = 34, Q3 = 51), representing more than 24 sports disciplines, participated in a cross-sectional survey. Participants completed the Satisfaction with Social Support Scale (ESSS; Pais Ribeiro, 1999, 2011), which assesses four dimensions (satisfaction with friends, intimacy, satisfaction with family, and satisfaction with social activities), and the Satisfaction with Life Scale (SWLS; Diener et al., 1985; Portuguese version by Simões, 1992). Sociodemographic and professional data were also collected. **Results:** Coaches reported a moderate level of overall satisfaction with social support ($M = 48.73$, 0-100), with the highest satisfaction reported for social activities ($M = 56.17$) and the lowest for intimacy ($M = 43.88$). The mean life satisfaction score was 18.53 (maximum = 25). Moderate negative correlations were observed between life satisfaction and all dimensions of satisfaction with social support, including the total score. No significant differences in satisfaction with social support or life satisfaction were found across coaching qualification levels. **Conclusion:** Contrary to expectations, greater satisfaction with social support was moderately associated with lower life satisfaction. These findings suggest that life satisfaction among coaches may be shaped by complex interactions involving work–life balance, professional demands, and perceived social resources, rather than formal qualifications alone. Health promotion strategies should consider these dynamics to better support coaches' well-being.

Palavras-chave/Key Words: Social Support; Life Satisfaction; Sports Coaches; Coaching Qualifications; Health Promotion

Body Composition Sex Comparisons in Badminton Players from the Portuguese National Team

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Resumo/Abstract:

It is well known that male and female have different body composition characteristics. However, those differences are not well documented in Badminton players. Using bioelectrical impedance analysis (BIA), including Phase Angle (PhA), it is possible to provide additional information about cellular integrity and general health. Thus, this study aimed to compare various body composition markers between male and female athletes from the Portuguese National Badminton Team. Ten female (age, 23.4 ± 3.0) and 13 male (age, 21.2 ± 3.6) elite Portuguese badminton players were evaluated by the InBody S10 which collected body fat mass (BFM), foft lean mass (SLM), fat free mass (FFM), skeletal mineral mass (SMM), intracellular water (ICW), extracellular water (ECW), total body water (TBW), phase angle (PhA, 50 kHz), ECW/TBW ratio and TBW/FFM ratio) The main results showed higher values for male athletes in PhA ($p = 0.005$), ICW ($p = 0.001$), ECW ($p = 0.017$), TBW ($p = 0.002$), SLM ($p = 0.002$), FFM ($p = 0.003$), SMM ($p = 0.001$), TBW/FFM ($p = 0.041$) and a lower value for BFM ($p = 0.001$). These findings suggest that sex has a major role when analysing body composition markers. As theoretically expected, male showed better results when compared with female athletes.

Palavras-chave/Key Words: Badminton; Fitness; Sports Performance

Leg length and catastrophe flags during simulated attack distance in taekwondo's young athletes

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Resumo/Abstract:

Introduction: The study of catastrophes, understood as the process of transition from one stable state to another stable state, has been used to understand the transitional process of motor actions (action scale). In movement behavior, body scale concept concerns about the importance of the interaction among intrinsic (individual leg length) and extrinsic (distance to target) constraints in action scale. **Methods:** With a sample of 8-10 years-old athletes of taekwondo, we checked whether the catastrophe pattern changed when the distance to a target changed (9 steps with intervals of 10 cm, from 20 cm to 100 cm from the target), under two conditions: (i) increasing distance; and, (ii) decreasing distance. This scanning procedure was applied to detect catastrophe flags and to estimate potential landscape based on the equation of Tuller, Case, Ding, Kelso (1994), in order to analyse the transition between the two most frequently used movement actions. Because of the importance in this sport, leg length was measured. Techniques observed were classified by a taekwondo' expertise. Informed consent and assent were obtained. **Results:** Seventeen different motor solutions were observed, but under mean leg length only at most 5 of them were present, being that in the decreasing condition significantly more of them occurred, that in the increasing condition, in distances above that anthropometric constraint. Between conditions, hysteresis occurred for the most frequent technique. In both conditions, one step before mean leg length distance, bimodality (based on mode of techniques frequency) was observed. With the two more frequently occurred techniques, potential landscape was adequately modelled, validating Tuller et al. (1994) equation. **Discussion:** Leg length and distance may be interacting control parameters in taekwondo attacking action scale.

Palavras-chave/Key Words: Catastrophe, Kinanthropometry, Motor control, Children, Martial art

Hand anthropometry and handball ball diameter children preference

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Resumo/Abstract:

Introduction: Hand size and fingers length are important anthropometric constraints for handball throwing (Vila Ferragut, 2019; Jimenez-Olmedo et al., 2019). Length fingers are important for ball control (Fernández et al., 2004) and throwing accuracy (Visnapuu Jürimäe, 2008). Additionally, adequate ball size is important to prevent fractures (Boyd et al., 2001). **Objective:** To verify the influence of hand anthropometric measures in the choice of ball' handball size in non-player children. **Methods:** Visnapuu Jürimäe (2008) hand measures protocol was used, for 6-12 years old non-player children (N=25, 15 girls), to whom was asked to manipulate handball balls, form size 00 to 2, in a random order, and to choose what ball they prefer to play. Informed consent and assent were obtained. **Results:** For hand measures, no significant sex differences were found; and, significant differences were found between ages for all measures, except for wrist-thumb-index perimeter. A significant direct association occurred among ball size choice and all anthropometric measures, except for the wrist-thumb-middle-ring perimeter. Age' ball size choice was significantly different; with children under 10 years old predominantly preferring ball size 00, and no child with or above 10 years old choosing it. **Discussion:** Hand anthropometric measures collected revealed to be an important variable for handball ball size choice in these non-player children, being the ball size 00 their preferred choice until 10 years old. Definition and production of handball' ball size for beginners under 12 years old, should took in consideration hand anthropometry and preferences of the children, for a greater success in the learning of handball motor skills (Tuquet et al., 2020).

Palavras-chave/Key Words: Kinanthropometry; Handball; Hand size; Ball size; Children

Meno(s)Pausa+Movimento: Promoting Active Aging and Health Among Postmenopausal Women Through Community-Based Exercise

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Resumo/Abstract:

The “Meno(s)Pausa+Movimento” project is a community-based health and physical activity initiative developed in Penafiel, Portugal, aimed at improving the well-being of postmenopausal women through structured exercise, health literacy, and interdisciplinary collaboration. This innovative program responds to the specific physiological and psychosocial challenges associated with menopause and aging, fostering autonomy, social inclusion, and active lifestyles. Launched in 2022 with 103 participants and reaching 197 women by 2025 (a 91.3% increase), the program offers three weekly group sessions, led by physical education professionals and supported by health experts, including physicians, nurses, and psychologists. Participants are monitored through functional and physical fitness tests, including muscle power, balance, and flexibility assessments, alongside qualitative indicators such as self-reported well-being and motivation. A key feature of the project is its collaborative, multi-sectoral approach—integrating municipal support, public health services, local sports infrastructure, and academic monitoring. Regular evaluations have shown a high adherence rate, with over 80% of women attending more than 70% of sessions monthly. Participants also report improved functional capacity, reduced perceived pain, and increased motivation for continued physical activity. The project demonstrates how local governance, educational institutions, and health systems can cooperate to develop scalable, inclusive interventions that address gender-specific aging processes. It further underscores the role of physical activity as a central pillar in public health promotion for older adults.

Palavras-chave/Key Words: Active Aging; Postmenopausal Women; Community-Based Exercise; Health Promotion; Physical Activity and Well-being

Effects of a Combined Exercise Programme on Physical and Mental Health in Patients with Fibromyalgia

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Resumo/Abstract:

Fibromyalgia is a chronic condition characterized by widespread musculoskeletal pain, fatigue and functional impairment that adversely affects both physical and mental health. Although exercise is recommended as a core intervention, rigorous data from long interventions is scarce. To determine the impact of a physical exercise programme using a combined training methodology (i.e., aerobic exercise, mobility, muscle strength and flexibility) on the components of physical health and mental health of SF-36v2 in patients with fibromyalgia, comparing baseline (M1) and post-intervention (M2) scores in the experimental and control groups. Forty women with fibromyalgia (54.47 ± 7.74) were assigned to an experimental group ($n = 20$) or a control group ($n = 20$) who participated in a low to moderate intensity combined training with 3 weekly sessions. SF-36 physical health and mental health scores were recorded in M1 and M2 (after eight months). Paired-samples t-tests ($df = 19$) assessed changes within the group. Both groups showed non-significant declines in physical health: experimental $\Delta = -3.05$ ($49.58 \rightarrow 46.53$; $t = 1.209$; $p = .242$); control $\Delta = -4.80$ ($54.44 \rightarrow 49.64$; $t = 1.696$; $p = .106$). The smaller reduction in the experimental group suggests a protective effect of exercise. In mental health, the experimental group improved significantly ($\Delta = +8.59$; $48.83 \rightarrow 57.42$; $t = -2.642$; $p = .016$), while the control group worsened ($\Delta = -14.01$; $57.03 \rightarrow 43.02$; $t = 3.197$; $p = .005$). A combined exercise programme modestly mitigated physical decline clinically relevant given the progressive nature and delivered immediate, clinically significant gains in mental health. These findings endorse regular and individualised exercise as an essential component of multidisciplinary fibromyalgia care to preserve function and enhance psychological well-being.

Palavras-chave/Key Words: Fibromyalgia; Physical Health; Mental Health; Physical Exercise; Quality of Life

Effect of Hypnosis and Motivational Audio Intervention on Training Frequency in Individuals with Low Motivation

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Resumo/Abstract:

This study investigated the impact of a hypnosis intervention combined with motivational audio reinforcement on training frequency in individuals with low motivation for physical exercise. Thirty adults aged 18 to 45 with a history of low gym attendance (defined as fewer than two workouts per week over the previous three months) participated. After an initial hypnosis session focused on enhancing motivation and commitment to exercise, participants received a short (8-minute) motivational audio designed to reinforce post-hypnotic suggestions, which they were instructed to listen to the night before each workout. Training frequency was monitored for three months before and three months after the intervention. A significant increase in average weekly training frequency was observed, rising from 2.0 sessions (SD = 0.5) to 2.4 sessions (SD = 0.6), $t(29) = 4.38$, $p=0.001$. These results suggest that hypnosis accompanied by motivational audio reinforcement may be an effective and accessible tool to promote exercise adherence in individuals with low motivation.

Palavras-chave/Key Words: Sports; Psychology; Motivation; Exercise

Types and Factors of Mobility in Children's Daily Lives

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Resumo/Abstract:

Introduction: A decline in children's mobility (in)dependence also appears to be associated with reduced autonomy in movement, as they spend less time outdoors, either commuting alone (e.g., home-to-school routines) or engaging in free play with peers. There is a well-relationship between mobility autonomy and the children's cognitive mapping of physical space, engagement in play and physical activity, and development of social relationships. **Methods:** This study aimed to: (1) analyze physical activity patterns among elementary school children; and (2) access their levels of mobility (in)dependence. A total of 186 children (91/48.9%) males and (95/51.1%) females), aged between 6 and 10 years ($M=8.76\pm1.24$), participated in the study. Data was collected using a structured, interviewed-administered questionnaire primarily composed of multiple-choice items adapted from previously validated instruments. **Results:** Second-grade students reported the highest bicycle usage (93.8%), with most riding on the street (76.0%), typically accompanied by family members (52.3%). They also showed the highest participation in physical activities at clubs or municipal facilities. The majority of students commuted to school by car (73.3%), particularly those in first grade. When traveling independently, children tended to remain within close proximity to their home street. **Conclusions:** The findings highlight a lack of independent mobility in low-density urban environments, as most children rely on car transportation and are not permitted to move in public spaces alone.

Palavras-chave/Key Words Children; Mobility; Physical activity; Routines; Daily activities

The Effects of Pilates and Stick Mobility Exercises on Posture and Subjective Well-Being Levels in Adolescents

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Resumo/Abstract:

Purpose: This study aimed to compare the effects of Mat Pilates (MP) and Stick Mobility (SM) exercises on posture and subjective well-being in adolescents and to explore whether a relationship exists between postural changes and psychological outcomes. **Materials and Methods:** A randomized controlled trial was conducted with 43 high school students (29 females, 14 males), stratified by Body Mass Index (BMI) and assigned to MP or SM intervention groups. Both exercise programs were delivered by a certified instructor over eight weeks, with sessions held three non-consecutive days per week, each lasting 45–60 minutes. Posture was assessed using the New York Posture Analysis, and subjective well-being was measured with the Oxford Happiness Questionnaire–Short Form before and after the interventions. The Shapiro-Wilk test was used for normality assessment. Paired samples t-tests were conducted to evaluate within-group changes, and Cohen's d was calculated to determine effect sizes. Additionally, Pearson correlation analysis was performed to investigate the relationship between posture and subjective well-being.

Results: The mean age was 14.76 ± 0.43 years in the MP group and 14 ± 0.43 years in the SM group. Both groups demonstrated significant postural improvements ($p = 0.001$) with large effect sizes (MP: $d = 1.05$; SM: $d = 1.12$). A significant improvement in subjective well-being was observed only in the MP group ($p = 0.01$, $d = 0.64$), while the SM group showed no significant change ($p = 0.052$). No between-group differences were found in final posture or well-being scores ($p = 0.89$ and $p = 0.80$, respectively). No significant correlation was observed between posture and subjective well-being ($r = -0.018$, $p = 0.910$). **Conclusion:** While both interventions improved posture, only MP positively impacted subjective well-being. These outcomes highlight the psychological benefits of MP and suggest distinct mechanisms underlying physical and psychological changes.

Palavras-chave/Key Words: Adolescent; Mat pilates; Subjective well-being; Posture; Stick mobility

Quality of Life among adults who do and do not engage in Physical Activity and Exercise

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Resumo/Abstract:

Introduction: The World Health Organization defines quality of life as the way individuals perceive their own lives, considering the culture and value systems in which they live, as well as their personal goals, expectations, standards, and concerns. Studies indicate that a better quality of life is strongly linked to the perception of well-being and overall health. **Objectives:** Analyse and compare the quality of life of Portuguese adults who are physically active or inactive. **Methods:** The WHOQOL-BREF questionnaire was used. This questionnaire consists of 26 questions that assess overall quality of life and four specific domains: physical, psychological, social relationships and environment. 231 individuals, with a mean age of 39 ± 13.2 years, 62.3% female, 49.8% married and 42% single, participated in this study. An overall characterisation of the sample's quality of life was conducted ($n = 231$), followed by a comparison between three distinct groups: physically active individuals ($n = 77$), individuals who engage in structured physical exercise ($n = 88$) and sedentary individuals ($n = 66$). Data normality was verified, and a one-way ANOVA was used to compare the groups with effect sizes also calculated. **Results:** In the overall sample, the highest scores of quality of life were observed in the social relationship's domain (71.3%), followed by the psychological domain (68.8%) and overall quality of life (68.5%). Statistically significant differences were found between physically active individuals and sedentary individuals, as well as between exercise practitioners and sedentary individuals, in overall quality of life and the physical, psychological and environmental domains, all with small effect sizes. **Conclusions:** In summary, the overall sample showed good levels of quality of life. When comparing the groups, those who were physically active or engaged in structured exercise reported higher levels of overall quality of life, as well as in the physical, psychological and environmental domains.

Palavras-chave/Key Words: Quality of Life; Adults; Exercise; Physical Activity; Sedentarism

Life4FitnessPro: Job Satisfaction of Fitness Professionals with different types of intervention (online, presencial and hybrid) – pilot study

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Resumo/Abstract:

Introduction: Job satisfaction among fitness professionals (FP) is linked to their professional fulfilment and influences how they perform their duties. FP can work in-person, online, or in a hybrid format. **Objectives:** This study aims to characterize the job satisfaction levels of FPs working in different formats: online, in-person, and hybrid. **Methods:** Job Satisfaction Scale, adapted and validated for the Portuguese population, was used. The scale has 15 items assessing various dimensions of job satisfaction, plus a global item. Data were collected between October and November 2024, via SurveyMonkey online platform. A total of 72 FPs participated (age: 30.1 ± 8.2 years; experience: 7.0 ± 6.9 years; 55.6% female, 44.4% male, most participants single (69.4%), with bachelor's degree (62.5%). In terms of intervention format, 9.7% worked online, 54.2% in-person, and 36.1% in a hybrid model. The results were analyzed using SPSS (version 29). A descriptive analysis was conducted, by means and standard deviations. To compare the FP groups with different interventions, normality was tested; since the assumption of normality was not met, the nonparametric Kruskal-Wallis test was applied, followed by Dunn's post-hoc test.

Results: Considering all participants, overall job satisfaction averaged 5.9 ± 1.9 . The highest-rated item was “Freedom to choose your work method” (6.8 ± 1.8), and the lowest was “Your promotion opportunities” (4.0 ± 2.7). Online FPs reported the highest job satisfaction (mean: 7.4 ± 1.5), followed by the FP that intervenes hybrid (6.2 ± 3.0), and the last group was FP that intervenes In-person (5.5 ± 2.0). Regarding comparisons, there were differences in 5 items in the FP that intervened in person and online, 2 differences between the in-person and hybrid FP and 1 difference between FP with online and hybrid intervention.

Conclusion: FPs report moderate to high job satisfaction. Online intervention appears to be associated with higher satisfaction levels. However, due to the small sample size and the pilot nature of this study, further research is recommended.

Palavras-chave/Key Words: Fitness Professionals; Job Satisfaction; Online intervention; In person intervention; Mixed intervention

Effect of a 15 Week Physical Exercise Program on Body Composition and Lower Limb Flexibility in Primary School Children

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Resumo/Abstract:

School is a privileged environment to promote physical exercise (PE) as well as the adherence and maintenance of healthy lifestyles throughout life. Flexibility is one of the fundamental components of physical fitness (PF), associated with improved motor performance in children, injury prevention and motor development of children. The implementation of structured and regular programs can be an effective strategy to improve PF. The aim was to evaluate the effects of a 15-week PE program on body composition (BC) and lower limb flexibility in children from 1st to 3rd grade. A total of 114 children aged between 6 and 9 years ($7.47 \pm .89$ years, 20-1st, 48-2nd and 46-3rd grades) participated in a 15-week program of moderate intensity consisting of one 30-minute session per week. Each session included a warm-up (mobility and running) followed by physical activities and games (e.g., human football, capture flag) designed to promote improvements in coordinative and conditional abilities. Assessments were conducted at baseline and post-intervention. BC was evaluated through weight and height measurements, following ISAK protocols, and BMI was calculated. Lower limb flexibility was measured using the sit-and-reach test. Improvements in BC were observed, with a decrease in mean weight and BMI values, although not significant. It was found the same pattern of improvements in the flexibility of both lower limbs in the mean values for all grades, with statistical significance in 3rd grade for both legs ($p = .001$). The results shows that the implementation of a 15-week PE program can promote improvements in lower limb flexibility in young children. Nevertheless, to promote improvements in BC, it may be necessary to have a multicomponent intervention including nutrition counseling. These findings highlight the importance of regular PE programs in schools as a strategy to develop essential physical capacities, contributing to children's health and well-being.

Palavras-chave/Key Words: Youth; Sit-and-reach; Physical Fitness; Kinanthropometry

A Comparative Analysis of Posture-Oriented Learning Outcomes in Middle School Physical Education Curricula: The Cases of Singapore and Türkiye

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Resumo/Abstract:

Postural development is essential for adolescent physical health and functional movement. Physical education (PE) curricula provide a platform to foster posture awareness and musculoskeletal fitness, though emphasis varies internationally. This study aims to conduct a comparative analysis of posture-related learning outcomes in the middle school physical education curricula of Singapore and Türkiye for students aged 12 to 14. Utilizing a qualitative research design with a descriptive and comparative document analysis approach, curriculum documents were systematically obtained from official government sources and examined through content analysis. Learning outcomes were categorized into three themes based on their relevance to posture: directly related, indirectly related, and unrelated. Findings revealed that in Singapore's curriculum, 76 out of 172 learning outcomes were directly linked to posture development, specifically focusing on alignment, core strength, postural control, and musculoskeletal health. In the Turkish curriculum, 26 out of a total of 122 outcomes across Grades 5 to 8 were identified as directly posture-related. These results highlight a stronger emphasis on postural education within Singapore's curriculum, reflecting a structured and integrated pedagogical approach to physical literacy and motor control. Conversely, Türkiye's curriculum appears to require further enhancement to support postural development more explicitly and systematically. In conclusion, the study underscores the necessity of integrating postural awareness and body alignment skills into physical education programs, particularly during early adolescence. For effective physical literacy and lifelong health, posture-focused competencies should be explicitly embedded within national curricula and supported through evidence-based pedagogical strategies.

Palavras-chave/Key Words: Postural education; Physical literacy; Curriculum standards; Secondary physical education; Cross-national comparison

Impact of a Motor Intervention Program on the Psychomotor Profile and Quality of Life of Older Adults in Day Care Centers: A Multiple Case Study

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Resumo/Abstract:

This study aimed to evaluate the impact of a motor intervention program on the psychomotor profile and quality of life of older adults attending a day care center. A multiple-case study with a mixed-methods approach was conducted with six participants over the age of 70, all regular users of a day care center, who took part in a three-month motor intervention program consisting of three 45-minute sessions per week. Assessments were carried out at three time points: pre-intervention, mid-intervention, and post-intervention, using the Geronto-Psychomotor Examination and the Quality of Life Assessment Instrument. Data analysis was based on systematic visual inspection. The evolution of each participant's scores was analyzed descriptively and interpreted within the context of functional progression, rather than through inferential statistics. Results indicated positive developments in both the psychomotor profile and perceived quality of life throughout the program. Regarding psychomotor performance, all six participants showed progressive improvements between the initial, mid, and final assessments, with total scores as follows: participant 1: 68.5 → 73 → 84; participant 2: 69 → 76.5 → 85; participant 3: 73 → 83 → 87; participant 4: 86 → 89 → 90.5; participant 5: 73 → 77 → 83; participant 6: 82 → 87 → 90. In terms of quality of life, improvements or stability were also observed over time, with the following scores: participant 1: 22 → 19 → 19; participant 2: 18 → 18 → 16; participant 3: 10 → 8 → 8; participant 4: 11 → 11 → 10; participant 5: 20 → 19 → 16; participant 6: 13 → 12 → 12. The motor intervention program proved effective in improving the psychomotor profile and promoting and maintaining quality of life in older adults in day care settings as a strategy to foster active and healthy aging.

Palavras-chave/Key Words: Active aging; Structured motor interventions; Psychomotor profile; Quality of life; Autonomy

The Effect of eight-week Resistance Training Proximity-to-Failure on Bioimpedance-Derived Body Composition and Fluid Parameters

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Resumo/Abstract:

Resistance training (RT) is a cornerstone of strength and conditioning training, inducing various physiological adaptations. Bioelectrical impedance analysis (BIA), including Phase Angle (PhA), offers a non-invasive window into body composition and cellular integrity. This study aimed to comprehensively characterize the pre- to post-training changes in body composition and fluid distribution (segmental water) variables following a structured RT training. This 8-week study (11 males and 8 females; age: 20.4 ± 1.7 and 24.8 ± 4.8 years) randomized limbs to resistance training until momentary muscular failure (FAIL) or with 2 repetitions-in-reserve (2-RIR) for unilateral Scott curl and unilateral leg extension exercises. Bioimpedance (InBody S10, 50 kHz) measured Phase Angle, body composition, and water compartments pre-post training. Paired t-tests analyzed pre-post changes; independent t-tests compared group differences. Pre-post training comparisons showed that body fat mass (FM) increased ($p=0.005$), while fat-free mass (FFM) and skeletal muscle mass (SMM) decreased (both $p=0.021$). Segmental water (SW) showed mixed regional responses: SW of the right arm (RA) and left arm (LA) increased (both $p<0.001$), but SW of the right leg (RL) ($p=0.003$) and left leg (LL) ($p<0.001$) decreased. Extracellular water to total body water ratio (ECW/TBW) of RA decreased ($p<0.001$), while LA ECW/TBW increased ($p<0.001$). This study demonstrates that an 8-week resistance training program significantly alters body composition and fluid distribution, with notable regional variations. These findings underline the importance of comprehensive body composition assessment in RT interventions and suggest that training effects may not be uniformly positive across all body compartments.

Palavras-chave/Key Words: Resistance Training; Phase Angle; Bioimpedance; Body Composition

Motor Competence Profiles of Portuguese Children: A Cross-Sectional Comparison of Football, Multisport, Non-Football, and Non-Sport Groups

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Resumo/Abstract:

Introduction: Football-specific training improves speed and agility, whereas multisport activities promote overall coordination more effectively than specific practices, suggesting the importance of multisport activities in developing motor skills. Programs concentrating exclusively on physical elements or just on football-specific skills may be inadequate for developing strong technical performance, underscoring the necessity to incorporate fundamental movement skills in training sessions. **Objective:** This cross-sectional study quantified differences in motor competence among children engaged exclusively in football, football plus other sports, other sports than football (swimming, basketball, gymnastics, combat sports...), or no organized sport. **Methods:** A total of 818 Portuguese children (age = 8.45 ± 1.17 years; both sexes) from five school groups in the Alentejo were assessed with the Motor Competence Assessment instrument. The groups were football ($n = 126$), football with other sports ($n = 48$), other sports ($n = 353$), and non-sport ($n = 291$). **Results:** Significant group effects were found for Stability ($\chi^2(3) = 44.81$, $p < 0.001$), Locomotion ($\chi^2(3) = 55.47$, $p < 0.001$), Manipulation ($\chi^2(3) = 26.62$, $p < 0.001$), and MCA Total Score ($\chi^2(3) = 60.99$, $p < 0.001$). Children without organized sports displayed lower scores than all sport-participating groups across every subdomain. No differences emerged between football and football with other sports. Both football-based groups outperformed the other-sports group in Locomotion ($p < 0.004$) and MCA Total Score ($p < 0.013$). **Conclusion:** Regular participation in organized sports is strongly associated with superior motor competence in children. Exclusive football practice provides advantages over participation in non-football sports for locomotor skills and overall MC, while combining football with additional sports offers no incremental benefit beyond football alone. These findings support school and community policies that ensure consistent access to structured sports, particularly football to optimize motor competence development during middle childhood.

Palavras-chave/Key Words: Motor competence; Childhood; Football; Sport participation; Cross-sectional

Main challenges faced by outdoor sports professionals working with people with disabilities

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Resumo/Abstract:

The inclusion of people with disabilities in outdoor activities remains a significant challenge for professionals in the field, due to factors such as limited accessibility, the constant need for activity adaptations, and insufficient specific training. This study aimed to identify the main challenges faced by professionals who work with this population in outdoor settings. A total of 11 professionals with prior experience in outdoor activities and with people with disabilities participated. An online questionnaire with closed-ended questions was administered, covering aspects such as types of disabilities encountered, strategies used, types of activities, frequency, observed benefits, encountered challenges, and suggestions for improvement. Responses were analyzed based on the frequency of selected options. Seven professionals reported having worked with people with disabilities, mainly in the motor (n=7), intellectual/developmental (n=6), and sensory (n=6) domains. Eight indicated no preference between homogeneous or mixed groups. The most common strategies used included adapting activity intensity (n=7), employing cooperative dynamics (n=6), and peer support (n=5). Leisure (n=7) and adventure (n=5) activities were the most frequently organized. Regarding frequency, responses were equally distributed among “frequently,” “sometimes,” and “rarely” (n=3 each); only one reported always organizing such activities, and one never. The most commonly observed benefits were improved mood (n=10), increased socialization (n=8), and reduced stress (n=6). The main challenges identified were the ongoing need to adapt activities (n=7), lack of specific training (n=5), and accessibility difficulties (n=4). Suggestions for improvement included stronger technical training for teams (n=9) and selecting locations with better accessibility (n=6). In conclusion, while professionals show a positive attitude toward inclusion, significant barriers remain. Strengthening training and adapting environments are key actions to make activities more inclusive, expanding access and promoting a more equitable and sensitive practice.

Palavras-chave/Key Words: Inclusion; Outdoor activities; Disability

Outdoor activities for the promotion of mental health

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Resumo/Abstract:

Outdoor activities have been identified as effective strategies to promote psychological well-being. This study aimed to assess the impact of these practices on mental health. Fifteen individuals participated (86.7% men and 13.3% women), aged between 20 and 49 years, recruited by convenience through an online questionnaire. Inclusion criteria were experience with outdoor activities and voluntary consent. The questionnaire covered sociodemographic data, frequency of practice, preferences, and the emotional, social, and psychological impact of the activities. Most participants (86.7%) started these practices during childhood. The most common activities were cycling, running, and orienteering disciplines. All participants showed a preference for outdoor environments, justifying this with feelings of tranquility, well-being, and physical benefits. Among the practices that most generated relaxation or happiness were cycling, running, surfing, bodyboarding, climbing, and hiking. Reports included intense emotional experiences during competitions and training. All respondents stated that contact with nature relieves stress and anxiety, promoting calm and inner peace. They also noted improvements in mood, concentration, personal organization, and a sense of accomplishment. The majority (86.7%) expressed a desire to involve others, despite recognizing barriers such as lack of time or initiative from third parties. Group practice (such as summer camps and federations) facilitated inclusion. Almost all (93.3%) expressed the wish to continue practicing, highlighting health benefits and the desire to maintain active longevity. It is concluded that outdoor sports have a strong positive impact on mental health, suggesting future investigations with larger samples and a focus on vulnerable populations.

Palavras-chave/Key Words: Outdoor Activities; Mental Health Promotion; Psychological Well-being

Effect of Abdominal Breathing on Cardiorespiratory Parameters in Firefighters

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Resumo/Abstract:

Introduction: The profession of firefighting carries significant risks, particularly concerning respiratory health and anxiety. Continuous exposure to toxic gases represents a constant threat to cardiorespiratory health; and situations of incertitude and risk acute stress to psychophysiological balance. Abdominal breathing technique (AB) has positive effects on systolic pressure (SP), and autonomous nervous system, namely baroreceptors' attunement and parasympathetic reinforcement. These physiological and psychological changes are studied in sport sciences, especially in the context of performance under stress, recovery, and autonomic regulation. **Objective:** To analyze if firefighters can acquire AB within 10 minutes of practice, through the acute effect in SP. **Methods:** Ten Portuguese firefighters (8 males, 33.2±11.16 years), made normal breathing (baseline), followed by AB explanation and exploration, and finally executed AB, in the supine position. For baseline and AB, breathing frequency was obtained through direct observation, and SP was collected minute by minute with a validated blood pressure monitor (Omron M4 Intelli IT, Omron Healthcare Co., Kyoto, Japão), during 10 minutes each. **Results: and Discussion:** The AB was characterized by a significant reduction in the breathing frequency ($p = 0.005$), for a value around cardiorespiratory resonance (7.48±4.67 breaths per minute). Systolic pressure significantly reduced ($p = 0.013$), reinforcing the effectiveness of AB in controlling cardiovascular parameters through parasympathetic nervous system. These results suggest that even a brief familiarization period is sufficient for firefighters, to effectively acquire AB, with positive acute effects, highlighting its feasibility for implementation in operational or training routines. **Conclusion:** These findings highlight the value of implementing AB among firefighters, promoting cardiorespiratory health and parasympathetic strengthening, aligned in a project of citizen science, by encouraging self-regulation and active participation in physiological and psychological health management in a risk profession.

Palavras-chave/Key Words: Firefighters, Citizen science, Breathing diaphragmatic, Motor control, Psychophysiology

Do Balloon and Beach Ball Afford Feet Juggling in 4-6 Years Old Children? Exploring the Role of Multisport Practice

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Resumo/Abstract:

Introduction: Feet ball juggling is essential in football, futsal, and teqball. To foster motor competence from early ages, developmentally appropriate challenges are required. The balloon (B) and the beach ball (BB) are usable by young children for this skill, because lighter, and the balloon is slower. Additionally, the engagement in various sports may afford the enrichment of children's motor literacy and motor development adaptability. **Objective:** To analyze if aged 4 to 6 perform foot touches with B and BB, depending on the individual sport experience. **Methodology:** Sixty boys (20 per age; $M=5.48\pm0.89$ years), from football schools, 45 only with football practice, and the remaining 15, also with practice in swimming ($n=7$); karate ($n=4$); basketball ($n=3$); rugby ($n=2$); and, judo ($n=2$), performed 3 trials for successive foot touches, with: preferred foot (PF); non-preferred foot (NPF); and, alternating feet (AF). **Results: and Discussion:** All executed at least one touch with both balls. Older children performed better in all conditions, with both balls. With BB, aged 5 performed significantly better than aged 4; meaning that B afforded dilution of age' motor experience, probably because the BB requires faster trajectory' perception-action coupling. In PF, with B, engagement in another sport revealed significantly more touches ($p=.039$), probably due to the effect of enriched motor development. Age did not differ significantly between groups (football-only: $M=5.57\pm0.91$; varied-sport: $M=5.19\pm0.81$; $p=.164$), supporting practice variety as the main factor. **Conclusion:** B and BB afforded motor practice of foot touches as soon as age 4. The B should be introduced first, as it reduces perceptual-motor task difficulty and is lighter for physical impact. Results sustain the hypothesis that experience in more than one sport may have a positive effect on foot touches acquisition, and highlight the necessity of fostering bilateral foot practice, for an adaptable motor development.

Palavras-chave/Key Words: Feet juggling; Motor development; Motor learning; Perception-action cycles, Sports practice

Retrospective analysis of the careers of Portuguese football players

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Resumo/Abstract:

Introduction: Understanding the sociodemographic and professional aspects of football players can assist in accurately depicting their reality and effectively addressing career-related variables. So, the study aimed to identify sociodemographic and professional characteristics related to the careers of former Portuguese football players. **Methodology:** The sample consisted of 84 Portuguese former players (48.8 ± 8.2 years old) with at least 8 years of professional experience, who finished their careers between 1988 and 2018. Quantitative data was collected from a validated semi-structure interview guide.

Results: and Discussion: Former Portuguese players had a career of 15.2 ± 3.1 years with more 6.4 ± 2.2 years of youth federated formation. Significant statistical differences were seen between former players with different competitive levels ($t(71)=3.843$; $p=0.001$) and international status ($t(82)=-2.740$; $p=0.008$). During their careers, 36% accomplish academic formation and 61.9% pursued technical education. Academic habilitation was statistically significant relationships with competitive level ($\chi^2(1)=9.655$; $p=0.002$) and international status ($\chi^2(1)=6.930$; $p=0.008$), unlike what happened with technical qualification ($p>0.05$). The majority of former players marry (83.3%) and have children during the career (82.2%). The divorce rate is 15%. Residential mobility is high (8.1 ± 5.55 years). The professional incomes were considered high or very high and 16.7% of former players developed addictions during their career.

Conclusion: Former players with higher competitive levels (players who played more than 50% of career years in the country's main league) and international status (players who had one or more internationalizations during the career) tend to have longer careers. Conversely, they tend to invest less in academic formation. The results reveals that the football career is brief and presents stress and risk factors, mainly at higher competitive levels. The findings contribute to a better understanding and discussion of the professional careers of former Portuguese football players.

Palavras-chave/Key Words: Football; former players; post-career; sociodemographic approach

Full-Time School: The Opinion of Children, Guardians and Teachers

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Resumo/Abstract:

This study aimed to analyze the Full-Time School (FTS) through the perspectives of children, guardians, and teachers, assessing its importance, impact, and operation. The sample consisted of 147 elementary school children, 120 guardians, 11 teachers, and 19 FTS technicians. The methodology adopted was qualitative, with separate questionnaires administered to each group. The results reveal high participation in FTS activities, with Physical-Motor Expression being the most appreciated by children. Guardians recognize the project as a unique feature, valuing the diversity of activities and the support for balancing family and work life. Technicians express high satisfaction with the project, highlighting its positive impact on students' overall development. However, teachers have some reservations, especially regarding the adequacy of the schedule and the profile of the technicians. The conclusion is that FTS is widely valued by its participants, even though there are opportunities for improvement in its implementation. The study highlights the importance of continuous and collaborative evaluation, with a view to optimizing the educational and social response provided by this school model.

Palavras-chave/Key Words: Full-Time Schooling; Enrichment Activities; Family Support; Child Development; Educational Policy

Relationship between Motor Competence and the 24-Hour Movement Guidelines in Preschool Children

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Resumo/Abstract:

Introduction: Motor competence refers to the proficiency in a variety of motor skills and is closely linked to health outcomes and engagement in physical activity. **Objective:** To characterize the motor competence of children aged 3 to 5 years and examine its association with physical activity habits, sedentary behavior, and sleep duration. **Methods:** This cross-sectional study included a representative sample of 98 preschool children ($M = 3.90 \pm 0.79$ years), of both sexes, attending preschool institutions in Portugal. Data were collected using the National Food, Nutrition and Physical Activity Survey questionnaire (to assess physical activity levels, screen time, and sleep duration), and the MOBAK-KG test battery (to assess motor competence). Descriptive statistics, independent t-tests, and Chi-square tests were used for data analysis. **Results:** The mean global motor competence score was 9.62. None of the children met the physical activity recommendations, and 57% reported no participation in physical activity. Sedentary behavior was elevated, with an average screen time of 129.7 minutes per day, and only 31.5% met the recommended limit. Average sleep duration was below the recommended level ($M = 9.74 \pm 1.33$ hours/day), with just 18% of children meeting the sleep guidelines. Regarding the integrated 24-hour movement behavior recommendations (physical activity, sedentary behavior, and sleep): no child met all three guidelines simultaneously; 9% did not meet any of the three recommendations and 22.5% of the sample met the recommendations for sleep and screen time combined. **Conclusion:** Healthy behaviors, and their interaction, have a direct impact on motor competence. In particular, adherence to adequate sleep duration and limitations on screen time are positively associated with higher levels of motor competence in preschool children, especially in the domains of locomotor and object manipulation skills. These findings reinforce the importance of promoting integrated movement behaviors across the day to support motor development in early childhood.

Palavras-chave/Key Words: Locomotor skills; Object control skills; physical activity; screen time; sleep time

Work-Related Stress, Burnout, and Quality of Life in Radiology Technicians: A Scoping Review Protocol to Inform Workplace Well-Being Strategies

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Resumo/Abstract:

Background: Occupational stress presents significant challenges to organizational health, affecting both employee well-being and service quality. This scoping review aims to synthesize existing research on stress, burnout, and quality of life among radiology technicians in various healthcare settings. The specific objectives are: (1) identify and describe the scientific literature addressing these outcomes; (2) examine the methodologies and instruments used; (3) explore trends based on age, sex and other sociodemographic variables; (4) identify knowledge gaps, propose directions for future research and workplace interventions. **Methods:** The review will follow the Joanna Briggs Institute methodology and PRISMA Extension for Scoping Reviews Checklist, with protocol registered on the Open Science Framework (10.17605/OSF.IO/2RCUF). Eligible studies must be observational studies peer-reviewed, involve radiology technicians (Population), assess work-related stress, burnout or quality of life (Concept) in any healthcare context (Context). Articles since 1995 written in English, French, Spanish or Portuguese will be included; reviews, protocols and opinion pieces will be excluded. Systematic research will be conducted on the Web of Science, SCOPUS, and PubMed using free-text and MeSH terms (stress, burnout, radiology technicians). Records will be managed in Endnote X9, with duplicates removed. Two reviewers will independently screen titles, abstracts and full texts. Discrepancies will be resolved through discussion or a third reviewer. Data will be extracted into Excel including authorship, year, country, study design, sample details, instruments, outcomes. Studies will be assessed for reporting bias by Quality Assessment Tool for Observational Cohort and Cross-Sectional Studies. A narrative synthesis will map stress, burnout and quality of life levels and explore associations with sociodemographic factors and summarize tools and analytical methods used. **Conclusion:** This review will offer a comprehensive overview of the literature and support the development of evidence-based strategies to improve the health and well-being of radiology technicians.

Palavras-chave/Key Words: Mental health; Workplace exposure; Professional well-being; Psychosocial risks

Associations between sleep patterns and cardiometabolic outcomes in middle-aged adults: a cross-sectional analysis

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Resumo/Abstract:

Background: Sleep plays a vital role in maintaining body homeostasis and health. Poor sleep quality and duration are associated with increased risks of mental and physical health issues. The National Sleep Foundation recommends ≥ 7 hours of sleep per night for adults. Sleep quality is defined by efficiency (SE) $\geq 85\%$, latency ≤ 15 minutes, ≤ 1 awakenings (> 5 minutes), and wake after sleep onset (WASO) ≤ 20 minutes. This study explores the associations between sleep patterns and cardiometabolic markers in middle-aged adults. **Methods:** Forty-five adults (53.3 ± 7.1 y old; 82.2% women) participated in this analysis. Participants wore a wrist tri-axial accelerometer (wGT3X-BT, ActiGraph) for 7 consecutive nights. Subjective sleep quality over the past month was also assessed by the Pittsburgh Sleep Quality Index (PSQI), which evaluates 7 relevant components of sleep difficulties and yields a global score; > 5 indicates poor quality. Body composition, blood pressure (BP), and fasting blood samples for glucose and lipids were collected. Spearman's and Pearson's coefficients were used for correlations. **Results:** ACTi graphic analysis showed participants slept on average 7.53 hours/night and had an average SE $> 85\%$. Sleep latency met the recommendations, but awakenings and WASO were slightly elevated. Total sleep time correlated positively with atherogenic index ($r = 0.303$, $p = 0.043$). Average awakening length and sleep fragmentation index correlated positively with systolic ($r = 0.375$, $p = 0.011$) and mean BP ($r = 0.299$, $p = 0.046$), respectively. PSQI global score averaged 5.9 ± 3.6 . Concerning their components, sleep disturbances were negatively associated with fat-free mass ($r_s = -0.346$, $p = 0.020$) and positively with %fat mass ($r_s = 0.531$, $p = 0.001$) and total cholesterol ($r_s = 0.372$, $p = 0.012$). Sleep medication was negatively associated with fat-free mass ($r_s = -0.332$, $p = 0.026$) and positively with glucose ($r_s = 0.317$, $p = 0.034$). Global PSQI score correlated positively with %fat mass ($r_s = 0.315$, $p = 0.035$) and glucose ($r_s = 0.350$, $p = 0.018$). **Conclusion:** Results suggest that poor subjective sleep quality and objective sleep disturbances are linked to adverse cardiometabolic outcomes, including increased body fat, glucose, and BP.

Palavras-chave/Key Words: Sleep quality; Cardiometabolic health; actigraphy; Pittsburgh Sleep Quality Index

Women Coaches in German High-Performance Sports: Findings from the QualiFT Project

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Resumo/Abstract:

Research has shown that women coaches are systematically underrepresented in German as well as in international high-performance sports (e.g., Bahlke, et al., 2003; Gieß-Stüber, 1998, Norman, 2021). Taking the recent Olympic Games in Paris as an example, only 14% of the 184 coaches that accompanied the gendered balanced team of athletes from Germany were women (21% in the 2024 Paralympics; DOSB, 2024, p. 7). The gender gap in coaching is thus significant, and it has wide-ranging effects on athletes, on the well-being of professional coaches, and on the sustainability of elite sport systems. However, up-to-date research on the underlying causes as well as possibilities for change in the German context are missing.

The research project “QualiFT” aims to address this need for knowledge by identifying gender-specific barriers and facilitators in coaches’ professional education and work situation. In close collaboration with key stakeholders, the 18-month-long project uses a mix of qualitative and quantitative methods. In a first sub-study, we analyse gender differences in coaches’ professional certificates and employment. In a second sub-study, a web-based survey and interviews with women coaches and stakeholders serve to map barriers and facilitators. In a third sub-study, strategies to improve gender equity in coaching are developed based on a document analysis and participatory workshops. Preliminary results from the first two sub-studies demonstrate that, overall, the number of women coaches with the highest high-performance coaching license is significantly lower than the number of male coaches with such a license. Furthermore, initial qualitative findings indicate that the underrepresentation of women coaches in German elite sports is closely linked to precarious working conditions as well as structural inequalities. Moreover, there is a lack of role models, pro-active recruitment strategies and gender-diverse education of coaches. To address these issues, QualiFT aims to develop multi-level strategies to support women’s coaching careers.

Palavras-chave/Key Words: Coaching; Gender equity; Women coaches; High-performance sport

Do Wellness Programs Reduce Injuries in Football and Futsal? Insights from a Systematic Review

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Resumo/Abstract:

Introduction: Football and futsal are sports that are widely practiced throughout the world. Due to their playing characteristics, namely the rapid change of directions, acceleration, spiriting and impacts, both are associated with a high risk of injury. In turn, injuries can contribute to the development of mental health problems. In other sports, the application of health and well-being programmes to reduce the incidence of injuries has shown positive results. However, the literature in football and futsal remains insufficiently explored, so its effectiveness is still uncertain. **Aim:** The present study aimed to conduct a systematic review analyzing the effects of health and well-being programmes on the incidence of injuries in federated athletes of football and futsal, without age restriction. **Methods:** A search was carried out into the main relevant databases on the subject. The literature selected was based on health and well-being programmes applied to football and futsal players which, after implementation, assessed the incidence of injuries examined. **Results:** Twelve experimental studies involving both youth and adult athletes were included, with interventions such as mindfulness, yoga, biofeedback, and integrated approaches combining physiotherapy and psychology. Most of the studies reported a reduction in the incidence of injuries, improved physical performance and reduced muscle tension. Some programmes also demonstrated mental health benefits, such as greater psychological resilience and better group cohesion. **Discussion and Conclusions:** The results suggested that wellness programmes can have a positive impact on both injury prevention and athletes' mental health. The methodological diversity and heterogeneity of interventions make direct comparison between studies impractical. The available evidence was more robust in football than futsal, revealing an important gap. Despite the encouraging results, more studies with high methodological quality are needed, especially in the context of futsal.

Palavras-chave/Key Words: Youth, Athletes, Injury, Health, Team sports

Anthropometric Variables and Physical Activity in Youth Soccer: Implications for Positional Specialization and Sports Selection

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Resumo/Abstract:

Introduction: Anthropometric characteristics and physical activity levels (PA) are used for talent detection and development, and positional specialization in soccer. However, the extent to which these variables differentiate youth players by field position remains inconclusive, particularly during adolescence, a period marked by rapid and heterogeneous growth. **Objectives:** Analyze the anthropometric, BMI and PA differences between positions; and association with experience. **Methodology:** 108 player boys (16.69±0.94 years), 31 U-16 (16.35±0.95 years), 29 U-17 (16.73±0.80 years) and 47 U-18 (17.07±0.4 years), from central region of Portugal. ISAK protocol was used for anthropometric measurements (height, sitting height, wingspan, weight). Mercê et al., (2020) pictorial Questionnaire was used to access PA. Specific sport experience was obtained. Position was classified as: goalkeeper, center-back, wing-back, midfielder and forward. Informed consent and assent were obtained. **Results: and Discussion:** Between positions, U-16 revealed significant differences in weight ($p=0.023$); U-17 in BMI ($p=0.034$), with midfielders ($M=20.0$) significantly lower than forwards ($M=23.4$) ($p=0.036$); U-18 in height ($p=0.014$), with center-backs significantly taller ($M=1.76$) than wing-backs ($M=1.74$) ($p=0.004$). So, as players evolve in their sport specialization, playing position may become more defined for body composition and height; and, no significant associations were found with experience PA, reinforcing the hypothesis that BMI and height may successively be important in positional specialization in soccer, more than experience or PA, which are similar among players positions. **Conclusion:** At these formation levels, when experience and PA are similar, probably, positional differentiation evolves from body composition factors (weight, BMI) to height, confirming results with professional teams.

Palavras-chave/Key Words: Football; Kinanthropometry; Motor development; Fitness; Sport formation

Long Covid Associated with Insufficient Physical Activity Level Among Older Adults in the Federal District, Brazil

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Resumo/Abstract:

Background: "Long COVID" is defined as a condition that arises three months after the onset of COVID-19, with symptoms lasting for at least two months and that cannot be explained by an alternative diagnosis. The long-term effects can impact various body systems, including the pulmonary, cardiovascular, and nervous systems, as well as having psychological impacts. **Objective:** To analyze the association between long COVID and insufficient physical activity levels in older adults. **Methods:** Epidemiological survey research with a cross-sectional design and a representative sample from the Federal District, Brazil. Data were collected through an electronic questionnaire. The variables analyzed were post COVID-19 sequelae (neurological, cardiovascular, respiratory, gastrointestinal, musculoskeletal, mental) and insufficient physical activity level (≤ 150 minutes per week). Multivariate analysis was performed using crude and adjusted logistic regression ($p \leq 0.05$). **Results:** A total of 1,363 older adults participated in the study, of whom 428 tested positive for COVID-19 and were eligible for this study. The sample had a higher proportion of female older adults (67.01%), aged between 60 and 74 years (82.2%), residing in low-income areas (51.2%), and with up to 12 years of education (57.7%). There was a high prevalence of older adults exposed to insufficient physical activity levels (46.5%) and who reported one or more post COVID sequelae (65.0%). In the multivariate analysis, insufficiently active older adults were twice as likely to develop long COVID and three times as likely to manifest musculoskeletal sequelae, in addition to an 86.0% greater probability of mental sequelae and 56.0% greater probability of neurological sequelae, when compared to their peers. **Conclusions:** The prevalence of long COVID in the sample studied was high and was associated with insufficient physical activity levels. The results highlight the need for health interventions aimed at preventing long COVID in older adults, with an emphasis on promoting physical activity.

Palavras-chave/Key Words: Post-Acute COVID-19 Syndrome; Aging; Epidemiology

Extension Project – Physical Exercise for Older Adults: The Experience of the University of Brasília, Brazil

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Resumo/Abstract:

Background: The Extension Project Physical Exercises for Older Adults, from the University of Brasília, has, since 1997, developed a program of physical exercises complemented by cultural activities aimed at promoting the health of the elderly population. The project is coordinated by the Study and Research Group on Physical Activities for Older Adults (GEPAFI), whose work has contributed to the development and dissemination of innovative practices focused on active and healthy aging. **Objective:** To describe the training methodology of GEPAFI and present its effects on the health of older adults. **Methods:** This is a descriptive study in which data from 78 GEPAFI participants, each with at least one year of practice and who completed an anamnesis form, were analyzed. GEPAFI adopts a standardized system aimed at resistance training for older adults, prioritizing efficiency, safety, and organization. Training sheets are structured according to complexity level and muscle groups, following scientific parameters. Exercises are performed in a circuit format, with an average duration of 60 minutes, and are individualized and adapted to the needs of each participant. **Results:** The sample consisted predominantly of women (76.9%), individuals with higher education (47.4%), and married (41.0%). The most prevalent conditions were arterial hypertension (46.2%), arthritis/arthrosis (39.7%), and osteoporosis (38.5%), all of which were mainly controlled through physical exercise. Despite reports of pain in the lumbar spine (42.9%), shoulders (36.4%), and knees (35.1%), 67.9% reported a reduction in pain after joining the program. Moreover, most participants had not experienced falls in the past 12 months and did not express concern about falling (91.0%). **Conclusions:** This study reinforces the relevance of the project as an effective strategy for promoting active aging. Initiatives of this nature can contribute to improving participants' health and quality-of-life indicators, while also strengthening university–community integration and consolidating the social role of institutions.

Palavras-chave/Key Words: Healthy Aging; Health Promotion; Health Policy

Assessment of inter-limb strength asymmetry and health care protection in Italian secondary school

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Resumo/Abstract:

Introduction: Inter-limb asymmetry (ILA) in lower-limb functional performance has been associated with increased risk of sport injury. Physical education (PE) in secondary school needs to monitor this factor: in fact, boys and girls participate in sports at school and in competitive matches. The study aims to verify the asymmetries in lower limb strength and aims to determine the ILA value in adolescents during PE class. **Methods:** A sample of boys and girls (N=210, M=114, F=96, 14.42±0.68 years, 167.58±4.12cm, 62.79±3.84kg) were assessed during PE classes. The lower limb strength was assessed for the dominant (D) and non-dominant (ND) leg using the One-Leg Hop Test (OLH) and the One-Leg Lateral Hop Test (OLLH). ILA was calculated by applying formula $1-(ND*100/D)$. Percentages > than 15% of asymmetry were considered significant and as a susceptibility to no-contact injury risk. **Results:** In the OLH the ILA values of boys are lower than girls (34 boys with ILA = 19.2±4.7% vs 42 girls with ILA=22.5±7.7%). In the OLLH, ILA values are confirmed: 50 boys (43.8% of sample) with ILA= 24.9±4.8% vs 58 girls (60% of sample) with ILA=29.7±9.6%. The rest of the samples (88 boys and 56 girls) showed in the assessments an ILA in the physiological range (15%). **Conclusion:** These results are coherent with previous studies that show considerable physical and physiological disparities between boys and girls in this age range, including size and strength discrepancies. The injuries' increase in PE and youth sports requires monitoring of all aspects that may contribute to the decrease of this trend. Assessment through OLH and OLLH is useful in physical education to identify ILAs. The findings demonstrate the need to provide compensatory strategies to address strength asymmetries, especially in girls. These countermeasures could limit the degree of ILA and the subsequent injury risk.

Palavras-chave/Key Words: Inter-limb asymmetry; Injury prevention; Physical education; Health; Assessment

Promoting Motivation and Psychological Well-Being Through Fitness and Resistance Training in Danish Schools

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Resumo/Abstract:

Introduction: Physical inactivity among adolescents is a growing public health concern, with only a minority meeting the recommended levels of physical activity. Schools represent a strategic setting for promoting physical activity; however, structured approaches to fitness and resistance training (FRT) remain underutilised. This study investigates the implementation of adapted FRT programmes in Danish lower secondary schools, inspired by the Australian Resistance Training for Teens (RT4T) framework. **Objectives:** The intervention emphasises students' motivation and experiences with FRT, aiming to explore how educational initiatives can foster self-efficacy and motivation for engaging in resistance training. During the development phase, students participated in co-creation workshops and classroom-based testing, offering feedback on their physical competence, confidence, and engagement. These insights directly informed the final intervention design. **Methods:** The study evaluates the impact of the intervention on students' self-efficacy, motivational regulation, and psychological well-being. Data were collected at two time points using validated instruments: the Resistance Training Self-Efficacy Scale, selected items from the Behavioural Regulation in Exercise Questionnaire-3 (BREQ-3), and the WHO-5 Well-Being Index. **Results:** Preliminary findings suggest that structured FRT programmes, when co-designed with students and teachers, may enhance students' confidence, perceived competence, and motivation to participate in physical activity. The educational framing of FRT contributes to broader physical literacy outcomes and may support sustainable behaviour change among adolescents. **Conclusion:** This study underscores the value of participatory design and rigorous evaluation in school-based health promotion. It holds the potential to provide critical evidence for scaling up FRT initiatives in schools and informing national strategies for youth fitness promotion and curriculum development.

Palavras-chave/Key Words: Resistance training; Adolescent motivation; School-based intervention; Self-efficacy; Psychological well-being

AI Predictive Capabilities in Match Analysis: Expected Goals Differential and Tactical Formations in Serie A 2024/25. A Comparative Study between Inter and Napoli

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Resumo/Abstract:

Background: Match analysis now integrates spatio-temporal data and artificial intelligence (AI) to inform real-time tactics. Expected Goals (xG) estimates a shot's scoring probability; the xG Differential (xG_diff = xG for – xG against) summarises chance quality and defensive solidity in a single indicator. **Purpose:** To evaluate the predictive value of xG_diff for Inter and Napoli in Serie A 2024/25, considering both own and opponent formations, and to derive implications for context-specific training design. **Methods:** We analysed 76 league matches (38 per team) using Wyscout. For each match, we recorded team and opponent starting formations (Wyscout taxonomy), xG for/against, final score, and possession, then computed xG_diff. We mapped own-formation × opponent-formation pairings and compared xG_diff (i) by match outcome (win/draw/loss), (ii) by opponent formation for Inter, and (iii) across Napoli's own formations. Statistical comparisons used one-way ANOVA with Tukey's HSD ($\alpha = .05$); analyses were conducted in R (base "stats"). We also profiled matches with xG_diff 0 to identify recurring unfavourable pairings. **Results:** Inter used 3-5-2 throughout and showed a graded xG_diff by outcome: wins +1.21, draws +0.05, losses –0.32 ($F(2,35)=112.4$, $p.001$). Versus opponents in 3-5-2, Inter averaged +1.35, compared with +0.68 (4-3-3) and +0.52 (4-5-1; $p.005$). Napoli alternated 4-3-3 and 4-2-3-1; no main effect emerged across its own formations ($F(6,31)=0.72$, $p=.633$). Descriptively, 4-3-3 performed well versus 3-5-2 but struggled against compact two-line defences (4-4-2, 4-4-1-1); 8/10 negative-differential matches paired 4-3-3 with such opponents. **Conclusion:** xG_diff shows predictive utility in elite competition and indicates that offensive effectiveness is relational, arising from formation-versus-formation interplay rather than any formation in isolation. These insights support AI-assisted, situational training that rehearses specific opponent configurations.

Palavras-chave/Key Words: Expected Goals Differential; Tactical Formations; AI-based Match Analysis

Influence of biological maturation on the force-velocity profile

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Resumo/Abstract:

Introduction: Force-velocity (F-V) profile is a method that describes the relationship between force produced and velocity attained during a specific motor skill, such as sprinting (Morin et al., 2019). This approach allows practitioners to highlight the mechanical strengths and weaknesses of the athlete (Hicks et al., 2023). **Objectives:** To date, few studies have investigated F-V profile according to biological maturation (Niederdraeig et al., 2025). This aspect should be considered since peak height velocity (PHV) is considered a key factor in assessing physical performance during youth sport. Therefore, the aim of this study is to examine horizontal F-V profiling across different maturation stages (pre-, mid- and post-PHV groups). **Methods:** Eighteen sub-elite soccer players (age: 13.43 ± 0.50 years; height: 164.3 ± 5.35 cm; weight: 54 ± 7.05 kg) were involved in this study. Maturity offset (MO) was estimated using the predictive algorithm (Mirwald et al., 2002). MySprint app was used to analyze the sprint trials. One-way ANOVA was used to detect differences between groups. The significance level was set at $p < 0.05$. **Results:** The post-PHV group significantly produced higher absolute force than both mid- ($p = 0.039$) and pre-PHV ones ($p = 0.012$), whereas relative force showed a significant difference ($p = 0.039$) between post- and pre-PHV groups. The post-PHV group showed greater absolute and relative maximal power compared to both mid- ($p = 0.016$; $p = 0.029$, respectively) and pre-PHV one ($p = 0.004$; $p = 0.023$, respectively). Peak ratio of force was significantly higher in the post-PHV group ($p = 0.037$) than pre-PHV one. **Conclusion:** The main findings revealed that the post-PHV group exhibited greater mechanical output compared to less mature participants, thus highlighting a substantial influence of maturation effects on sprint capability. Therefore, it is needed to consider these insights for a proper training load in young soccer players.

Palavras-chave: Maturity; Sprint; Performance; Workload; Youth athletes

Sport and governance: peacebuilding in communities affected by the armed conflict in Colombia

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Resumo/Abstract:

Five decades of victimizing events have affected the lives of Colombians and exposed them to diverse forms of violence. The conflict's consequences were evident in the weakening of the bonds between citizens because of limited cooperation and the loss of faith in country institutions. The limitation of the government is to guide the country amid great social conflicts in an exercise of territorial governance. The community improve their own mechanisms to contribute to local development under a peace-building approach to overcome social vulnerabilities. The research study focuses on highlighting the collective capabilities that a community sport experience promotes among members of communities affected by social conflicts for an effective contribution to promote positive change. The study used qualitative descriptive methods of inquiry and six in depth semi structured interviews. The study offers five public policy recommendations based on the results: the evidence to local governments and the national government in Colombia.

Palavras-chave/Key Words: Capabilities; Community; Governance; Sport; Peace

Active Mathematics bridging Italy and Portugal through dynamic education

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Resumo/Abstract:

Introduction: this pilot study replicates the “Active Mathematics” intervention developed by Ramos, Simões, and Franco (2024) in a Portuguese primary school, adapting it to the Italian educational context near the University of Salerno. **Objective:** the project aimed to integrate physical activity into mathematics class to enhance student engagement, inclusion, and learning outcomes. **Methods:** two parallel second-grade classes ($n = 27$) were assigned to experimental and control groups, both taught by the same mathematics teacher. Over 12 weeks, the experimental group participated in one weekly 45-minute math lesson using movement-based games, while the control group followed traditional seated instruction. Physical activity was tracked via accelerometers, and mathematics performance was assessed through pre- and post-intervention tests. **Results:** findings mirrored those of the original Portuguese study (Ramos et al., 2024): the experimental group showed a significant increase in physical activity without any decline in academic performance. Teacher perceptions evolved positively, noting improved attention, participation, and comprehension. The intervention fostered inclusion, with remarkable progress observed in an autistic student. The special education teacher confirmed its dual benefits for learning and socialization, and the school principal praised the approach as more effective than traditional methods. Students expressed enthusiasm for the weekly active sessions, and the teaching staff showed interest in continuing the project next year. **Conclusion:** this cross-cultural replication highlights the adaptability of the “Active Mathematics” model and its alignment with WHO guidelines on physical activity and inclusive education. By bridging educational practices between Italy and Portugal, the study offers a dynamic and scalable approach to enriching primary school instruction.

Palavras-chave/Key Words: Active Learning; Mathematics Education; Movement based class

The effectiveness of eSports in enhancing motor learning and performance in youth football

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Resumo/Abstract:

E-sports, particularly football, are growing strongly due to their playful and educational (edutainment) component, which combines learning and entertainment. Although designed primarily for cognitive development, eSports can also stimulate motor skills and encourage physical activity, counteracting sedentariness. They improve skills such as concentration and quick decision-making, with professionals showing reaction times similar to elite athletes. However, little evidence exists on how a training protocol integrating eSport activities can affect both physical and technical-tactical performance and motor learning perceptions, using cognitive and ecological-dynamic approaches. This study aims to explore the link between the physical and learning effects of 2 different training protocols, referring to the 2 approaches: cognitive and ecological-dynamic, and that the latter combines the use of football eSports in educational processes and the development of reactivity, speed and the technical-tactical component of the game fundamentals. The sample comprised 62 young footballers (12-16 years), divided into a control group (CG) and an experimental group (EG). The CG followed a cognitive protocol, while the EG participated in ecological-dynamic exercises with eSport integration. Both groups were assessed using the BlazePod, the 30-metre sprint test and the adapted Illinois Agility Test with ball. A questionnaire was administered to collect the athletes' perceptions of cognitive and physical improvements. Statistical analysis included ANOVA for repeated measures and the Wilcoxon test for perceptions of learning. The EG showed significant improvements: reduced reaction time (709.10 ms to 683.55 ms), improved sprint (4.908 s to 4.651 s) and increased agility (17.33 s to 16.51 s). EG participants reported more positive perceptions than CG on the cognitive and motor benefits of eSport use ($p .001$). The ecological-dynamic approach, integrated with eSport, is more effective in improving reactivity, speed and technical-tactical skills than the traditional cognitive approach. The results suggest significant educational potential for integrating eSports into youth training protocols.

Palavras-chave/Key Words: eSports; Ecological-Dynamic Approach; Cognitive Training; Reaction Time; Youth Football Training

Sustainability and Impact of Erasmus+ Sport Martial Arts Projects

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Resumo/Abstract:

Background: The Erasmus+ Sport programme is one of the main sources of funding for projects that combine physical activity, social inclusion, and educational innovation. Among the disciplines involved, martial arts – from judo to karate, from taekwondo to aikido and even capoeira, have been employed as multidimensional instruments of intervention. The projects have addressed issues such as the inclusion of at-risk youth, female empowerment, bullying prevention, psychological well-being, and the promotion of life skills. Despite the variety of approaches, the fate of the outputs once funding ends remains little explored. **Purpose:** The aim of this study is to analyse the extent to which Erasmus+ Sport projects dedicated to martial arts have produced concrete and lasting effects after the end of funding, investigating whether the project outputs have actually been reused by sports and educational organisations and which factors have influenced their continuity and sustainability over time. **Method:** A systematic document analysis was conducted on a selection of projects funded between 2016 and 2022, comprising collaborative partnerships, small-scale partnerships, and non-profit sport events. The data collected were processed using the JASP software, which enabled the calculation of frequencies, percentages, means, and standard deviations for the variables considered. **Results:** Manuals and toolkits accounted for 32.4% of the outputs, followed by digital/online training materials (29.4%), pilot events (20.6%), and digital platforms (17.6%). Post-project continuity was observed in 58.8% of the cases, with higher rates for manuals (72.7%) and platforms (83.3%), while local events showed limited continuation (28.6%). **Conclusion:** The sustainability of the projects depends on the type of output and on the capacity to activate networks that ensure follow-up even after the project's conclusion. The transformative potential of martial arts within European project design is confirmed as strong, but to be realised it requires a project approach oriented towards durability.

Palavras-chave/Key Words: Sustainability; Implementation; Impact; Networking; Methodology

Impact of Body Composition on Performance of Young Basketball Players

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Resumo/Abstract:

The general objective of this study was to analyze the impact of body composition and anthropometric characteristics on the performance of U14 male basketball players from regional team selections in Portugal. A quantitative methodology was employed, with a cross-sectional, descriptive, and correlational design. Participants were invited from various regions of Portugal, and body composition measurements—including body fat percentage and fat-free mass—were collected on game day using standardized procedures. Performance was assessed using the Performance Index Rating (PIR) as the independent variable, while body composition measures—including weight, height, BMI, muscle mass (MM), fat mass (FM), fat-free mass (FFM), bone mass (BM), and total body water (TBW)—served as dependent variables. All analyses were conducted in RStudio (v2025.05.1). Due to non-normal distributions (Shapiro–Wilk $p < 0.05$), Spearman's rank-order correlations were used. PIR showed moderate positive associations with height ($\rho = 0.296$), MM ($\rho = 0.280$), FFM ($\rho = 0.280$), weight ($\rho = 0.272$), BM ($\rho = 0.274$), and TBW ($\rho = 0.262$), with smaller but significant correlations for FM and BMI. To address multicollinearity, principal components analysis (PCA) was applied. PC1 (overall body size) significantly predicted PIR ($\beta = 0.046$, $p = 0.001$), while PC2 (fat-versus-lean axis) showed a non-significant trend ($\beta = -0.041$, $p = 0.077$). Together, PC1 and PC2 explained 7.8% of PIR variance ($R^2 = 0.078$, $p = 0.001$). These findings suggest that larger, leaner body profiles positively influence youth basketball performance.

Palavras-chave/Key Words: Body Composition; Performance Index Rating (PIR); Youth Basketball; Competition

Regulation and recognition of sports professions across the European Union

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Resumo/Abstract:

Introduction: In Italy, the sports sector has developed significantly following its constitutional recognition in 2023 and legislative reforms, including Legislative Decree No. 36 of 2021 and Budget Law No. 197 of 2023. These measures defined three professional profiles: the kinesiologist, the sports worker, and the primary school physical education teacher, each with distinct pathways. Nevertheless, overlaps between the kinesiologist, who holds a degree in sport sciences, and the sports worker, regulated by the National Olympic Committee, create challenges in ensuring compliance with the EU's requirements for regulating sports employment and facilitating worker mobility. The regulatory framework remains fragmented, distributed across state legislation, university programs, and federation rules. By contrast, several European models integrate training, certification, and professional recognition within the European Qualifications Framework (EQF). **Objective;** This study examines the regulatory development of sports professions in Italy after the 2021 and 2023 reforms, comparing it with EU Member States where the profession of “sport instructor” is regulated, to evaluate labour mobility and EQF alignment. **Method:** The research is based on documentary analysis of Italian legislation, implementing decrees, and European transparency tools, with specific reference to the European Commission's Regulated Professions Database. Regulatory models in Spain, Portugal, France, Austria, Croatia, Switzerland, Hungary, Latvia, Slovakia and Czech Republic were examined, evaluating training, certification, and competence recognition processes in relation to the EQF. **Results:** Findings reveal substantial differences in integrating academic training, institutional recognition, and certification. In Italy, fragmentation persists, with limited recognition of kinesiologists, while most EU countries combine formal and non-formal education. Variations in course length, entry requirements, and progression reflect national frameworks and uneven EU implementation of mobility tools. **Conclusion:** To enhance sports professions, stronger coordination between education systems and qualification regulations is needed. Shared standards, even beyond the EU, could overcome fragmentation and promote cross-border recognition of sports professional profiles.

Palavras-chave/Key Words: Sports professions; EQF; Sports law; Kinesiologist

Comparative Analysis of the Performance Profile of Soccer and Basketball Athletes: Towards a Mapping of the Sport-Specific Conditional Model

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Resumo/Abstract:

Background: Soccer and basketball have distinct performance models: soccer favors long-lasting intermittent aerobic efforts, alternating with sprints and changes of direction, while basketball requires explosive movements, repeated jumps, and high intensity over short intervals. These differences influence the development of strength, endurance, agility, and power. Although many studies have investigated the performance models of each sport, none have analyzed how these models may affect the long-term development of individual athletes' physical qualities. **Purpose:** To compare the performance profiles of amateur soccer players and basketball players in order to identify the conditional qualities most required in each discipline and provide a functional mapping of the specific requirements. **Method:** Sample: 10 soccer players (20,3 years old; 175 cm; 75 kg) and 10 basketball players (21,6 years old; 186 cm; 81,7 kg), with no experience in weight training. The following tests were administered: Countermovement Jump (lower limb power), 20 m sprint (speed), RAST test (anaerobic capacity), and Pro Agility test (agility). **Statistical Analysis:** descriptive statistics, MANOVA for overall differences, T-Test for comparison in individual tests, and Pearson correlation for internal relationships within each group. **Results:** MANOVA showed significant overall differences ($p < 0.05$). The T-test showed differences for 20 m sprint and CMJ ($p < 0.05$), but not for RAST and agility. In soccer, 20 m speed and agility are correlated, as are jump height and anaerobic power; in basketball, 20 m speed and anaerobic power are strongly associated. **Conclusion:** The performance model influences the development of conditional abilities: basketball players excel in power and vertical actions, soccer players in horizontal speed and agility. This evidence can guide coaches in planning targeted training, even in the absence of in-depth testing, to optimize performance and prevent injuries. Future studies will include cardiovascular variables (e.g., $\text{VO}_{2\text{max}}$) to complete the picture.

Palavras-chave/Key Words: Sprint; Vertical jump; Anaerobic capacity; Speed-strength

Physical Education in Primary Schools: International Comparison and Perspectives for Sustainable Development

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Resumo/Abstract:

Introduction: Physical Education (PE) plays a central role in promoting the physical, mental, and social well-being of children, contributing to the United Nations 2030 Agenda Sustainable Development Goals (SDGs), particularly Goal 3 (Good Health and Well-being) and Goal 4 (Quality Education). In Italy, the 2021/2022 reform introduced two mandatory weekly hours of PE in primary schools and progressively assigned specialist teachers to 4th and 5th grades. Despite recent regulatory interventions in Italy, structural challenges persist that hinder the full development of an educational offer aligned with international standards **Purpose:** The aim was to compare the Italian PE model in primary schools with those of selected European and extra-European countries, identifying strengths and weaknesses, highlighting good practices, and proposing strategies for improvement.

Methods: A qualitative comparative analysis was conducted using official documents, ministerial guidelines, recent reports, and studies from national and international organizations. The variables considered were lesson time allocation, the presence of specialist teachers, infrastructure, specific curricula, and assessment methods. **Results:** The analysis revealed substantial variability in PE models among the countries examined. Nordic countries stand out for their structured, competence-oriented approach, high-level teacher training, and innovative monitoring systems, although inclusivity challenges remain. Mediterranean countries often present infrastructural limitations and fewer specialists, despite having defined national curricula. Extra-European countries generally invest more in infrastructure, advanced assessment programs, and specialist teacher training, significantly contributing to the SDGs, particularly in health, well-being, and quality education. **Conclusion:** The comparison highlighted the need for a balanced approach combining adequate infrastructure, specialist teacher training, and inclusive policies to ensure effective and high-quality PE in primary schools. The Italian reform marked an important step forward but could benefit from further investments and strategies inspired by successful international models.

Palavras-chave/Key Words: Quality education; Teacher training; Education; Physical practice

Illinois Agility Test adapted to the fundamental of leading the ball in basketball.

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Resumo/Abstract:

Background: The ability to change direction and quickness of movement are essential qualities in the game of basketball. The Illinois Agility Test (IAT) is one of the most widely used tests to assess general agility, but it does not consider ball control. The main problem lies in the lack of specificity of the validated IAT, in that although the athlete may demonstrate excellent skills in changes of direction, this does not guarantee that they will translate effectively into game situations where it is necessary to maintain control of the ball or perform complex technical movements. **Objective:** To examine the importance of the relationship between agility, quickness of movement, changes of direction and motor skills, which are fundamental in the basketball. **Method:** The sample consists of 15 male Under-17 players (age 16.7 ± 0.8 ; height 185.1 ± 6.5 ; weight 75 ± 7.1 and BMI 21.9 ± 1.5). The IAT will be administered in an adapted form with and without a ball. The course involves the use of 4 central cones, 2 blazepods, and 2 photocell stations. Paired sample t-test to compare running times with and without the ball. **Results:** Average times recorded (without ball $16.2 \text{ sec.} \pm 0.5$ and with ball: $18.1 \text{ sec.} \pm 0.7$) with a p-value 0.01. The introduction of the ball into the IAT radically changes the assessment paradigm, allowing not only motor skills but also specific technical-motor skills to be analyzed. **Conclusions:** The adaptation of the IAT represents a significant advance in the assessment of specific agility in team sports such as basketball. This test is an innovative and functional solution for monitoring the technical-motor evolution of athletes, personalizing athletic training by integrating technical agility, and highlighting deficiencies in ball control at speed or when changing hands.

Palavras-chave/Key Words: Basketball; Adapted test; Motor skills; Performance

Assessing Sport Science Students' Views on Artificial Intelligence: Perceptions, Attitudes, and Educational Needs

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Resumo/Abstract:

Artificial intelligence (AI) is redefining students' learning and daily activities. A 48-item online survey assessed perceptions and attitudes toward AI among 215 sport science students (60.2% males, 38.7% females) from two Italian universities. While 45.9% considered their AI knowledge sufficient, few could explain, in general or in detail, concepts like machine learning (7.2% and 3.3%), deep learning (5.5% and 2.8%), or neural networks (8.8% and 1.7%). AI use for academic tasks varied from "never" to "several times per month": literature search (36.5% and 14.4%), text analysis (29.3% and 13.3%), understanding questions/concepts (12.3% and 18.8%), and improving writing (36.5% and 11%). AI was perceived as "moderately" to "extremely" risky due to biased data (32% and 6.1%), security/privacy issues (28.7% and 17.7%), and dehumanization (26% and 23.2%), but also as highly advantageous for time savings (35.4% and 13.8%), workload reduction (40.3% and 11.3%), and research progress (29.3% and 16.3%). In sport science, AI was considered "moderately" to "extremely" advantageous in monitoring biomechanics (35.7% and 7.7%), training personalization (29.3% and 3.3%), injury prevention (36.5% and 6.6%), real-time performance assessment (26.5% and 13.3%), rehab (31.5% and 7.2%), data collection and analysis (28.2% and 17.1%), teaching (25.4% and 6.1%), virtual training environments (32% and 8.8%), season planning (36.5% and 7.2%), and enhancing accessibility for disabilities (30.4% and 21%). Few students reported receiving formal AI training in high school (9.4%) and university (9.9%), with self-education via Internet and trial/error as most common ways to acquire digital skills. Respectively, 50.3% and 44.8% are interested in further AI knowledge. For their university studies, most are interested in curriculum and electives AI courses, AI integration into teaching, workshops, labs and online courses to enhance their skills. Overall, students recognize AI's potential but need more formal education. Enhancing curricula and practical training can bridge existing knowledge gaps.

Palavras-chave/Key Words: Artificial Intelligence (AI); Sport Science Students; Educational Needs

Analysis of forces during the execution of the gyaku tsuki technique, with and without impact, in 10 year old': An exploratory study

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Resumo/Abstract:

Background: Karate is a martial art and combat sport that, in addition to its competitive aspect, contributes to motor and physical development, particularly during childhood. Training enables the acquisition of specific motor skills, such as the gyaku tsuki. In the competitive context, kumite stands out as controlled sparring between athletes according to WKF criteria, and kata as the technical and artistic expression of karate, evaluated by technical and athletic parameters. This experimental study aimed to compare the forces generated in the execution of gyaku tsuki with and without impact in children aged between 8 and 10 years. **Methodology:** Three subjects (one female and two males), with a mean age of 9.61 ± 0.47 years, regular karate practitioners and participants in federated competitions, were included. Each participant performed 10 repetitions of the technique under two conditions: without impact and with impact on a punching bag. An inertial sensor (IMC-20948) was placed on the right wrist, allowing the recording of accelerations in the X (medio-lateral), Y (antero-posterior), Z (vertical) axes. The data were processed and converted into absolute force and relative force to body mass, and analyzed using a customized MatLab routine. **Results:** In the antero-posterior plane, greater force was observed in the posterior direction, with higher values in the impact condition. In the vertical plane, force was mostly directed downward in both conditions, also being greater with impact. These patterns were consistent among participants, although individual differences in the magnitude of forces applied were noted. **Conclusions:** Overall, participants produced more force in the impact condition with greater amplitude in the antero-posterior axis. Although the direction of force remained similar between conditions, the magnitude differed, reinforcing the importance of incorporating both forms of execution in the technical learning process.

Palavras-chave/Key Words: Gyaku tsuki; Impact force; Inertial sensor; Karate

High-intensity interval resistance training in higher education students: Study protocol for a randomized controlled trial

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Resumo/Abstract:

Faced with rising levels of physical inactivity and mental health challenges among higher education students, innovative and time-efficient exercise strategies are increasingly needed within academic settings. This study aims to contribute meaningful insights into the promotion of mental and physical well-being among higher education students by evaluating the effects of a time-efficient High-Intensity Interval Resistance Training (HIRT) program. It will follow a longitudinal, quantitative, randomized intervention design. Participants will be divided into two groups: an intervention group engaging in a five-week HIRT protocol, and a control group with no structured training. Pre- and post-intervention assessments will be conducted to evaluate changes in mental health and physical fitness. The HIRT program will consist of bodyweight-based sessions delivered twice weekly. Each 31-minute session will include warm-up, conditioning, and cool-down phases. The warm-up phase (5 minutes) and includes three sets of Jumping Jack and Mountain Climber, each performed for 30 seconds with 15 seconds of rest between exercises and 45 seconds between sets. The main phase (24 minutes) consists of four sets of squat jump, push-up, jumping lunge, spiderman plank, burpee, superman plank, and skipping, interspersed with 45 seconds of rest. The cool-down (2 minutes) involves stretching the major muscle groups used during the session. Heart rate will be continuously monitored using Polar OH1 sensors, and internal training load quantified based on time spent above 90% HRmax and TRIMP methods. Mental health will be assessed using the Portuguese version of the Hospital Anxiety and Depression Scale. Physical fitness will be evaluated through standardized tests and body composition by bioelectrical impedance analysis. The intervention will follow CERT guidelines. Adherence is defined as attending $\geq 75\%$ of sessions; retention as completing both assessments. This study will provide evidence on the effectiveness of HIRT as a practical strategy to reduce sedentarism and enhance well-being in university populations.

Palavras-chave/Key Words: Fitness; Physical Activity; HIRT; Mental Health; CERT

Fine Motricity in Finger Tapping Test: Fractal and Entropy Analysis

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Resumo/Abstract:

Introduction: Nonlinear analysis methods, such as fractal and entropy analysis, seem a powerful tool to investigate the temporal structure of the movement and its predictability, making them ideal to characterize complex biological systems, like neuromuscular system. Fractal and entropy analysis applied to fine motor tasks, such as the Finger Tapping Test (FTT), allow to explore how individuals process sensory information across multiple timescales, helping to characterize the movement in different ages. **Objectives:** With FTT task, to analyze the fractals' sensitivity to distinguish elderly and young people; and, to compare the differences in complexity and predictability between distinct age groups. **Methods:** 20 young adults (18.3 ± 0.56 years old; $\bar{f}=5$) and 19 elderly (84.4 ± 6.23 years old; $\bar{f}=11$), performed the FTT, for 60 seconds, using both hands, with an inertial sensor attached to the index finger. Cutted and normalized, with no filter applied, data was processed in a customized routine in MATLAB. For the acceleration and angular velocity data, the DFA (detrend fluctuation analysis) was calculated in raw form, to preserve the integrity and prevent values' bias. **Results:** Elderly exhibited significantly higher DFA values in the preferred hand for acceleration (≈ 0.63 , 0.52) and angular velocity (≈ 0.62 , 0.50), with low p-values (≈ 0.001 , and 0.007 , respectively) and large effect sizes (Cohen's $d \approx 1$). Sample Entropy of acceleration was significantly lower in elderly' preferred hand (≈ 1.25 , 1.49 ; $p = 0.036$; $d \approx 0.63$). **Conclusions:** These findings suggest that aging is associated with increased complexity and predictability, especially while performing the task with the preferred hand. With FTT task, the DFA appears to be sensitive to distinguish different age groups; however, further research is required to elucidate the reasons underlying the observed discrepancies relative to reference values.

Palavras-chave/Key Words: Fractals; Entropy; FTT; Fine Motricity; Motor Development

Gross and fine motor skills development throughout lifespan: A project with nonlinear approach

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Resumo/Abstract:

Introduction: The Dynamical Systems (DS) theory describes systems that are constantly changing and evolving over time. According to DS, human movement emerges as a result of interactions between subsystems that depend on each other. To better describe these interactions nonlinear analysis has shown to be a notable method to highlight the properties of system adaptation to initial conditions (deterministic). By incorporating age as an initial condition in nonlinear models, we can significantly enrich our understanding how internal/external adaptations lead to changes of motor control throughout life. Addressing motor control across the lifespan, through the assessment of movement, provides valuable insights into the neuromuscular system, enabling the detection of motor changes associated with both efficient or pathological movement patterns. The importance of fine motor skills in childhood and in the early detection of neurodegenerative diseases is well known, as they often reveal either healthy development or the first symptoms of such conditions, respectively. Similarly, the role of gross motor skills in the wellbeing of youth and older adults is widely recognized. However, how motor function changes throughout the lifespan remains unclear, largely due to gaps in the study of motor skills, particularly during active adulthood. **Objective:** Assessing fine and gross motor skills to monitor, screen and identify motor changes in a lifespan perspective. **Methods:** 1) To conduct a systematic review on the methodology and protocols used in different methods of assessing fine and gross motor skills throughout life; 2) Evaluate fine and gross motor skills through medium to long time series, enabling the use of nonlinear algorithms to detect changes across the lifespan.

Palavras-chave/Key Words: Dynamical Systems; Motor Control; Assessing Lifespan; Fine Motor Skills; Gross Motor Skills

High levels of attention, connection to nature and subjective well-being through walking and sensory exercises

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Resumo/Abstract:

The innate propensity for connection to nature, based on the Biophilia Hypothesis, is inherent to the human species, yet the cultural component assumes an importance that cannot be ignored. Humans' perception of the natural world—their emotional and cognitive understanding and interpretation of nature—is strongly shaped by the socio-historical contexts. Life in large cities, separation from nature, and the destruction and degradation of many natural areas pose the challenge of promoting strategies for nature reconnection. Bipedal walking is an original act, inseparable from the history of human beings and, in the context of the evolution of species, from human ecology itself. The primal and primordial act of walking emerges as a privileged physical activity for restore connection to nature and promote subjective well-being (SWB), especially when combined with other exercises and/or complementary techniques. The main objective of this exploratory study was to identify perceptions of connection to nature and SWB in the context of walking. To this end, a mixed-methods approach was adopted, combining quantitative and qualitative methodologies. The quantitative phase began with a pretest involving 34 participants, conducted to refine the instruments and ensure clarity. This was followed by an online survey with 450 respondents. The survey included validated instruments such as the Connectedness to Nature Scale (CNS), adapted to the study context, and the Inclusion of Nature in Self Scale (INS), as well as Likert-type questions related to nature connection and well-being. Internal consistency of the scales was assessed using Cronbach's alpha, with coefficients ranging from 0.66 to 0.91, indicating acceptable to excellent reliability. The qualitative component followed a phenomenological approach, aiming to capture participants' lived experiences of nature immersion. This phase included three control walks and three sensory walks conducted in a forest setting. Data was collected through 33 post-walk field questionnaires and six semi-structured interviews. All qualitative data were analyzed using the Interpretative Phenomenological Analysis (IPA) framework, allowing for an in-depth interpretation of subjective experiences. The mixed-methods design enabled data triangulation and enriched the findings by integrating both statistical trends and individual narratives. The results provide evidence that sensory walks mediate perceptions of nature connection and SWB, with potential health-related benefits. Specifically, elements such as silence, high levels of attention, and guided sensory exercises were found to significantly contribute to both nature connectedness and SWB.

Palavras-chave/Key Words: Walking; Walks; Nature perception; Nature connection; Well-being

Evaluation of Functional Knee Instability in Sports: A Bibliometric Review Protocol

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Resumo/Abstract:

The assessment of knee instability is crucial for understanding its impact on joint functionality and patient quality of life, particularly in a sporting context. Despite advancements, objective metrics often lack consensus or ecological validity in real-world scenarios. This protocol outlines a study to critically analyze the most cited questionnaires employed to assess knee instability in sports. The focus will be on their psychometric properties, including validity, reliability, and sensitivity to clinical changes, as well as their bibliometric impact. The term “most cited” will refer to instruments identified through citation analysis based on absolute number of citations over the defined period. This bibliometric review will systematically search three electronic databases (PubMed, Web of Science, and Scopus) using a comprehensive strategy that includes MeSH terms like “knee,” “instability,” and “questionnaire,” combined with Boolean operators. The search will consider studies published between 1979 and 2024, chosen to encompass the potential introduction of relevant instruments. Inclusion criteria will cover any study design, population (i.e., professional and amateur athletes), utilizing tools for knee instability evaluation with patient-reported outcomes. Exclusion criteria include non-English articles, studies with participants having other pathologies, or those lacking tool descriptions. Data extraction will encompass scale name, first author, publication date, journal information, total citations, and detailed psychometric properties (e.g., test-retest reliability, internal consistency, number of items, subscales, scoring). VOSviewer will be utilized for bibliometric analyses, including co-occurrence networks, cluster analysis based on content, and temporal trends. Methodological quality will be assessed using the Consensus-based Standards for the Selection of Health Measurement Instruments Risk of Bias (COSMIN-RB) checklist. This synthesis is expected to aid researchers and decision-makers in establishing evidence-based guidelines, defining criteria for safe return to sport, and developing new instruments.

Palavras-chave/Key Words: Knee; Instability; Questionnaire; Sports; Bibliometrics

Inclusive Physical Education in Lower Secondary Schools

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Resumo/Abstract:

Background: Physical exercise can serve as a powerful tool for valuing diversity, as evidenced by numerous studies in literature. However, in lower secondary schools, there is a lack of structured extracurricular physical activities that intentionally combine the enhancement of motor skills with inclusive development. **Purpose:** The aim of the study is to develop an inclusive physical education protocol to be applied in extracurricular settings, aimed at improving basic motor skills and promoting greater perception and awareness of one's physical, emotional, and relational potential. **Method:** Two second-year classes of lower secondary school were involved, for a total of 44 students. The classes took part in a three-month extracurricular project, totalling 90 hours. The sample was divided into a control group, which participated in extracurricular physical activities aimed at enhancing motor skills, and an experimental group, which instead followed a structured inclusive physical education protocol based on cooperative and adaptive teaching. For both classes, standardised physical tests adaptable to heterogeneous school populations were administered in the pre and post intervention phases. To measure perception and awareness, an ad hoc questionnaire was developed. The data collected were analysed using descriptive and inferential statistics. **Results:** The analysis of the results showed a significant improvement in basic motor skills within the experimental group, with $p .05$ in all administered tests. From the questionnaire results, it emerged that the perception of one's body in motion improved by 23%, while emotional awareness during the activity recorded an increase of 18% in the experimental group ($p = .023$). **Conclusion:** The study highlighted that an inclusive physical education protocol, applied in an extracurricular context, can lead to a significant improvement in basic motor skills and an increase in students' psychophysical awareness, with more marked results compared to a traditional approach.

Palavras-chave/Key Words: Extracurricular; Cooperative; Assessment; Awareness; Adaptive

Does Phase Angle distinguish athletes from a regular low and high-water drinker?

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Resumo/Abstract:

Background: Phase Angle (PhA), derived from bioelectrical impedance analysis (BIA), is recognized as a marker of cellular integrity and membrane function. However, whether individuals with chronically different water intakes (WI) present differences in PhA remains uncertain. Moreover, bioelectrical impedance vector analysis (BIVA) has been proposed as an approach capable of detecting subtle hydration-related alterations. **Objective:** This study aimed to determine whether habitual WI patterns, high drinkers (HD) (n=27; WI $\geq$ 40.0 mL/kg/d) versus low drinkers (LD) (n=36; WI $\leq$ 35.0 mL/kg/d), influence BIA parameters, Resistance (R), Reactance (Xc), Impedance (Z), PhA, and BIVA in competitive athletes. **Methods:** This cross-sectional subanalysis evaluated sixty-three competitive athletes. Dual-energy X-ray absorptiometry (Hologic Explorer W, QDR for Windows version 12.4, Waltham, MA, USA) was used to assess body composition, and BIA parameters were assessed using a bioelectrical impedance spectroscopy device (model 4200, Xitron Technologies, San Diego, CA, USA). WI was calculated using seven-day food records. Vector analysis was conducted using BIVA, based on sex-specific reference values. Group comparisons were conducted with general linear models adjusted for sex and fat-free mass. Vector displacement was evaluated with Hotelling's t^2 test. **Results:** PhA did not differ between water intake groups ($p > 0.05$). In contrast, BIVA revealed a significant vector displacement in males ($p = 0.039$), with LD showing higher R (R/H), reactance (Xc/H), and impedance (Z/H) normalized to height than HD (R/H: $p = 0.011$; Xc/H: $p = 0.027$; Z/H: $p = 0.032$). No differences were observed in females. **Conclusion:** While PhA alone does not appear to distinguish habitual hydration status in athletes, BIVA demonstrated greater sensitivity to hydration-related tissue differences, particularly in males. These findings highlight the potential of BIVA as a valuable tool for identifying subtle physiological adaptations associated with habitual fluid intake in athletic populations.

Palavras-chave: Bioelectrical impedance Analysis; Bioimpedance Vector Analysis; Body Composition; Hydration; Phase Angle

Regulation of disciplinary frameworks in European sports body: A comparative analysis

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Resumo/Abstract:

Introduction: The regulation of sports disciplines in Europe is marked by significant heterogeneity, reflecting several body and institutional legal models. Within European area, disciplinary regimes for both competitive athletes and non-professional participants differ in the legal basis of disciplinary powers, the nature of the athlete–organization relationship, sanctioning procedures, and the level of procedural safeguards granted. **Purpose** The aim of this study is to comparatively analyze the national institutional law and the regulatory, disciplinary, and sanctioning systems adopted by ENSE member states, considering the applicable rules for different categories of athletes, the legal nature of sports organizations, the role of the state in disciplinary proceedings, and access to appeal mechanisms. **Method** The research is based on a comparative analysis conducted through the examination of national law, sports federal normative sources, disciplinary regulations of major national federations, court decisions, institutional European documents, and academic literature. Selected ENSE member states were analyzed with particular attention to consistency with the principles of the Council of Europe and the European Sports Charter. **Results:** Findings reveal distinct approaches: in Italy and France, sports disciplinary power is formally recognized and regulated by the state, with public-law norms and oversight of proportionality; in Germany and the Netherlands, a contractual model prevails, framed within the associative relationship between athlete and federation; Spain adopts a mixed system, where federations exercise public functions but within an administrative guarantees framework. Access to independent appeals bodies, such as the Court of Arbitration for Sport, is uneven. Non-professional athletes generally benefit from fewer procedural safeguards and less structured sanctioning regimes. **Conclusion:** The fragmentation of disciplinary regimes hampers athlete mobility and the protection of fundamental rights. The study calls for strengthening institutional dialogue within ENSE to develop shared guidelines on disciplinary regulation, access to appeals, and procedural guarantees, while preserving national specificities.

Palavras-chave/Key Words: Sports regulation; Disciplinary justice; Non-professional athletes; Comparative sports law

Comparison between Italy (EU country) and Albania (non-EU country) in sport area as a methodological model in European area

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Resumo/Abstract:

Introduction: Currently, there is legislative and regulatory diversification both within the European Union (EU) and not in sport area could be an obstacle to the free workers circulatory. To examine this issue between Italy and Albania could be useful to search an alignment model that could be extended to other non-EU of Balcanian area as membership candidate. **Purpose:** The aim is to identify convergences and differences in university professor pathways, in primary school physical education (PE) teachers and i professional licensing sport systems for trainers between Albania and Italy to be used as a methodological model to applicable for the harmonization in European area. **Method:** The analysis is based on the Albanian rules and Italian ones by concern a modelling for comparing the EU and non-EU countries. University recruitment processes, training requirements, qualification procedures, PE primary school and the sports workers were examined. **Results:** Albania and Italy share public selection criteria, structured academic pathways, and licensing systems for coaches and trainers, in line with European recommendations. However, differences remain in the full implementation of reforms, in the integration between universities and sports federations, and in the organization of physical education in primary schools. In Albania, historically entrusted to generalist teachers, a reform is underway to introduce specialist teachers, running in parallel but not fully coinciding with the gradual introduction of similar roles in Italy. **Conclusion:** The comparison with Italy, extended to EU and none of Balcanian area, shows that harmonizing professional pathways in sport and physical education requires not only the adoption of common standards, but also synchronization in the timing and methods of implementation. The recent experiences of Albania and Italy offer insights for a shared model in the European area, aimed at ensuring quality, transparency, and sustainability.

Palavras-chave/Key Words: Academic regulation; Sports training; PE primary teachers; European harmonization; Sustainability

Development and Validation of the Boxing Novice Posture and Technique Evaluation scoring system: a new tool for basic boxing technical skills assessment

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Resumo/Abstract:

Background: Boxing enhances cardiovascular health, strength, endurance, and coordination, while also supporting mental focus, self-discipline, and overall physical, cognitive, and psychological development. Introducing boxing courses for female students can challenge stereotypes, promote gender equality, and foster self-defense skills, self-esteem, and assertiveness. **Aim:** This study aimed to develop a specialized scoring system to assess the basic boxing technical skills of novices. A customized “Boxing Novice Posture and Technique Evaluation (BNPTE)” scoring system was pilot-tested by three highly experienced coaches to evaluate the fundamental skills of 24 female sport science students enrolled in an introductory boxing course at the Sport University of Tirana. **Methods:** the assessment focused on the technical execution of the boxing stance and three punching techniques (i.e., straights, hooks, and uppercuts), performed both in static and dynamic conditions. Participants’ performances were evaluated using the four subscales of the BNPTE: 1) Stance; 2) Straight lead and rear techniques; 3) Hook lead and rear techniques; 4) Uppercut lead and rear techniques. Subscale 1 consisted of five items: shoulder, chin, body weight, feet and hands. Subscales 2-4 each consisted of four items: on guard position, execution, trajectory, and body weight. All items across the four subscales were evaluated using a 4-point Likert scale, where 1 indicates poor execution, 2 fair, 3 good, and 4 very good. The coaches’ scores for each of the four subscales demonstrated very good inter-rater reliability, with values above 0.8. Additionally, the test-retest reliability, assessed one week after the initial measurement, showed very good agreement across all subscales. **Conclusion:** The development of the Boxing Novice Posture and Technique Evaluation scoring system proved to be a reliable and valid tool for assessing basic boxing techniques in female novices. Its strong inter- and test-retest reliability supports its application in evaluation settings, promoting proper skill development in introductory boxing courses.

Palavras-chave/Key Words: Boxing skills assessment; Technical assessment; Performance scoring system

Analysis of premenstrual symptoms according to physical activity levels in Portuguese female university students: a pilot study

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Resumo/Abstract:

Introduction: Premenstrual symptoms affect a substantial proportion of women of reproductive age, often impacting daily activities, including academic performance. Physical activity is considered a potential strategy for alleviating premenstrual symptoms through hormonal regulation, stress reduction, and endorphin release. However, the relationship between different physical activity levels and premenstrual symptoms severity remains unclear. **Objective:** To compare premenstrual symptoms between students with different physical activity levels. **Methods:** An analytical cross-sectional study was conducted with 30 female students (22.0 ± 5.6 years) enrolled at a Portuguese Polytechnic Institute during the 2024/25 academic year. Premenstrual symptoms were assessed using the 17-item Daily Symptom Report. Symptoms were rated on a 5-point scale (0–4) from absent to very severe, with a maximum total score of 68 points, based on the impact on routine activities. Physical activity was measured with the short version of the International Physical Activity Questionnaire (IPAQ). Data were processed according to the official IPAQ scoring protocol, classifying participants into three physical activity categories: low, moderate, and high. As the data did not follow a normal distribution, the Kruskal–Wallis test was applied. **Results:** The mean ($\pm$ SD) total premenstrual symptom scores were 24.64 ± 15.18 ($n = 11$) for the low activity group, 21.27 ± 13.86 ($n = 11$) for the moderate activity group, and 26.38 ± 17.71 ($n = 8$) for the high activity group. No significant differences were found in total premenstrual symptom scores among the groups ($p = 0.874$). **Conclusion:** In this sample, total premenstrual symptom scores did not differ according to physical activity level. Future studies with larger samples and analysis of specific symptom domains are warranted to better understand the potential protective role of physical activity against premenstrual symptoms.

Palavras-chave/Key Words: Pre-menstrual symptoms; Physical activity; Female university students; Pilot study

Relationship Between Pre-Pregnancy Physical Activity and Physical Activity During Pregnancy

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Resumo/Abstract:

Regular physical activity (PA) during pregnancy is recognized for benefits in promoting maternal and fetal health. Guidelines recommend moderate-intensity PA throughout gestation (WHO, 2020), provided no medical contraindications. This retrospective study aimed to examine the relationship between PA practiced before pregnancy and the intensity and type of PA performed during pregnancy. Fifty pregnant women participated in the study, of whom 30 reported engaging in PA prior to pregnancy and 20 did not. To assess energy expenditure during pregnancy, the Pregnancy Physical Activity Questionnaire (PPAQ) was used (Mesquita, 2015). The PPAQ estimates weekly energy expenditure (MET-h/week) according to intensity levels (sedentary, light, moderate, and vigorous) and PA domains (household/caregiving, transportation, sports/exercise, and occupational activities). Independent samples t-tests were conducted to compare the two groups regarding PA intensity and PA domains. For analytical purposes, moderate and vigorous intensities were grouped, following health guidelines that emphasize the need for at least moderate-intensity PA (>3 METs) for maternal health benefits. No statistically significant differences were found between women who were active before pregnancy and those who were not in terms of sedentary time ($p = 0.915$), light PA ($p = 0.185$), or moderate-to-vigorous PA ($p = 0.376$). Similarly, there were no significant differences in household/caregiving ($p = 0.510$), transportation ($p = 0.731$), or occupational activities ($p = 0.162$). However, a marginally significant difference was observed in the domain of sports and exercise ($p = 0.056$), with previously active women reporting higher engagement in structured physical activity. These findings suggest that while pre-pregnancy PA may not significantly influence total energy expenditure or engagement in daily activity types, it appears to be associated with greater involvement in structured exercise during pregnancy. Promoting regular PA before pregnancy may thus support healthier activity patterns during gestation, particularly in compliance with current prenatal exercise guidelines.

Palavras-chave: Exercise; Pre-pregnancy habits; Maternal Health; PPQA

Group differences in premenstrual symptoms according to sedentary behavior in Portuguese female university students: a pilot study

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Resumo/Abstract:

Background: Lifestyle factors, including sedentary behaviors, may influence the severity of premenstrual symptoms. In university students, prolonged sitting is a prevalent sedentary behavior that could be associated with premenstrual symptom severity. **Objective:** To analyze differences in premenstrual symptoms according to sedentary behaviors in Portuguese female university students. **Methods:** This is an analytical cross-sectional study including 54 female participants (22.4 ± 6.9 years), who were students at a Portuguese Polytechnic Institute during the 2024/25 academic year. Premenstrual symptoms were assessed using the 17-item Daily Symptom Report. Symptoms were rated on a 5-point scale (0–4) from absent to very severe, with a maximum total score of 68 points, based on the impact on routine activities. Sedentary behavior was measured through two questions on daily sitting time from the short form of the International Physical Activity Questionnaire (IPAQ), one for a weekday and one for a weekend day. Group differences in premenstrual symptom scores according to sitting time (≤ 7 hours vs. > 7 hours) were analyzed using the Mann–Whitney U test. **Results:** The mean ($\pm$ SD) total premenstrual symptom scores were 23.42 ± 13.07 (≤ 7 h, $n = 24$) and 26.00 ± 13.50 (> 7 h, $n = 30$) on a weekday, and 24.07 ± 13.04 (≤ 7 h, $n = 43$) and 27.91 ± 14.22 (> 7 h, $n = 11$) on a weekend day. No significant differences in total premenstrual symptom scores were observed between groups based on sitting time on a weekday ($p = 0.423$) or weekend day ($p = 0.491$). **Conclusion:** In this pilot study, sedentary behavior did not appear to influence premenstrual symptom severity. However, further studies with larger samples and analysis of specific symptom domains are recommended to clarify the impact of sedentary behavior on premenstrual symptoms.

Palavras-chave/Key Words: Pre-menstrual symptoms; Sedentary behaviors; Sitting time; Female university students; Pilot study

Analysis of the running between runners, futsal athletes and non-runners: the sensibility of inertial devices to assess 3D ground reaction forces

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Resumo/Abstract:

Introduction: The study of running is essential for both injury prevention and exercise prescription, as this activity generates high impact forces that may lead to several lower limb injuries. **Objectives:** This study aimed to analyse and compare ground reaction forces (GRF) among three distinct groups: runners (CR), futsal athletes (FUT), and non-runners (NCR), using inertial measurement units (IMU). **Methods:** The sample consisted of 15 healthy adult participants, 8 male and 7 female with a general mean age of 23, the runners had a mean age of 24, the futsal athletes 23 and the non-runners 22, they were distributed equally across the three groups, 5 for each group. The data was collected using an inertial sensor placed on the external malleolus of the right lower limb during running in a straight line with 14 meters. The GRF was calculated based on acceleration data given by the IMU through Newton's Second Law, for the antero-posterior, vertical, and medio-lateral axes. **Results:** The results showed that the FUT group exerted greater GRF in the antero-posterior direction, reflecting the specific demands of futsal, such as quick changes in direction. The NCR group demonstrated higher vertical GRFs, possibly related to lower technical efficiency. In contrast, the CR group applied less vertical GRF and showed greater medio-lateral stability, indicating an increased running efficiency. **Conclusions:** These findings show that IMUs have sensitive to assess GRF and can assist exercise and healthcare professionals to develop injury prevention strategies, prescribing appropriate training, and optimizing athletic performance.

Palavras-chave/Key Words: Biomechanics; Ground reaction forces; Inertial sensors; Runners; Futsal athletes; Non-runners

Analysis of the running between runners, futsal athletes and non-runners: the sensibility of inertial devices to assess motor coordination

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Resumo/Abstract:

Introduction: Coordination patterns can substantially help to understand and to improve the specific movements of sports and exercise. **Objective:** This study aimed to analyze the intra-segmental motor coordination of lower limbs across three groups: runners, futsal athletes, and non-runners. **Methods:** Fifteen adult distributed among the groups had inertial measurement units (IMU) on the lateral malleolus of the right lower limb, to collect angular velocity of the leg in sagittal, frontal, and transverse planes during running in a straight line with 14 meters, simulating a long distance run. The raw gyroscope data (angular velocity) was filtered, then mathematical integration was applied to obtain the angular displacement, followed by correction of the drift, allowing the construction of the phase plots. **Results:** Runners showed irregular cyclical movements. Futsal athletes showed irregular patterns, consistent with the sport's demand for fast and unpredictable movements. Non-runners displayed greater disorganization and asymmetry, less smoothness and a greater dispersion of mean lines, indicating a worse intra-segmental coordination. Consistently across all groups, the sagittal plane showed the most coordinated movement, whereas the transverse plane demonstrated the least coordination, with a big linear dispersion and less smooth lines. **Discussion:** Inertial devices allow to differentiate groups and to deeply analyze motor coordination. For professionals in the field, these results may contribute to injury prevention strategies and individualized training prescriptions.

Palavras-chave/Key Words: Intra-segmental motor coordination; Inertial sensors; Running; Futsal; Non-runners

Solution Strategy Proposal: Sociological Framework for Integrating Standard, Harmonised, Multidisciplinary and Up-to-date Antidoping Education into European Sports Related Undergraduate Programmes' Curricula

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Resumo/Abstract:

Introduction: But how can it be that a sports-related undergraduate curriculum does not include anti-doping knowledge? This absence is as striking as a surgeon graduating without learning sterility, or an art student without understanding copyright. Three interrelated problems emerge: (1) doping in sport itself, which threatens health and integrity; (2) the lack of systematic anti-doping knowledge across the sport ecosystem; and (3) the asymmetric way in which future sport professionals are exposed to this knowledge. Actor-Network Theory (ANT) frames the problematization: universities, faculty, NADOs, legal frameworks, and teaching resources remain weakly connected, leading to fragile networks where knowledge is inconsistently transmitted. Pragmatic sociology highlights how such asymmetries shape unequal curricular outcomes. Quantitatively 113/1,202 European programmes (9.4%) explicitly include anti-doping content, while they significantly differ qualitatively. **Objectives:** This proposal simulates a sociologically grounded, practical strategy to reduce curricular asymmetry by designing a standardised, multidisciplinary course for undergraduate sport programmes. **Methods:** ANT's four stages guide the approach: problematization (identifying curricular asymmetry), intéressement (engaging stakeholders such as academics, NADOs, athletes, legal and medical experts), enrolment (assigning roles in course design), and mobilisation (envisaging diffusion through universities and faculty networks). The methodology includes creating a curriculum draft consortium with representatives from sports science, medicine, law, athlete communities, and anti-doping professionals; designing a multidisciplinary, balanced one-semester course on anti-doping conforming Bologna Process; translating materials into all European languages; and delivering faculty workshops across 580+ universities with procedural guides to ease integration. Pragmatic sociology complements this by explaining how disparities of capacity and engagement must be addressed to translate stakeholder priorities into curricular change. **Results: and conclusions:** The envisaged outcome is a standardised one-semester course covering medical, legal, ethical, and sociological

perspectives on doping. While elimination of doping cannot be promised, this strategy can reduce knowledge gaps, harmonise curricula, and foster a better-informed European sport ecosystem.

Palavras-chave/Key Words: Antidoping Education; Actor-Network Theory; Pragmatic Sociology; Curriculum Standardization; European Higher Education

Pilot study for real time heart rate monitoring validation during front crawl swimming

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Resumo/Abstract:

Introduction: In swimming, it has been previously described that a viable way to monitor athletes' heart rate is through the temple optical heart rate (HR) sensor. The objective of this pilot study is to determine if the “Polar Team” software is a potential solution for accurate HR real-time monitoring during front crawl swimming. **Methodology:** Twelve individuals (4 females and 8 males aged between 15 and 30 yo) were equipped with two optical sensors positioned on the right and left temple. The one on the breathing side was transmitting to the polar team software and the other was saving the HR data in its internal memory. All subjects performed a protocol comprising uninterrupted 3x50m front crawl swimming with increasing intensity. Exercise intensity was divided into 5 zones and the total time spent in each effort zone was compared between devices and expressed as a percentage. A cutoff value of 10% was set to deem the difference as acceptable for further studies. **Results:** The differences between the Polar Team application and the optical HR temple sensor fell below 10% in all intensity zones (between -8.0% in Z2 and 4.8% in Z5). The smallest difference was observed in Z3 (3.9%). **Conclusion:** The results demonstrate that the data transmitted to the polar app in real time are fairly similar to those saved in the sensor's internal storage during front crawl swimming. An advantage of the Polar Team is that heart rate values are displayed in real time. Further studies are needed to assess the validity of the data and the agreement with other “gold standard” devices, like a chest strap, and to test other swimming strokes.

Palavras-chave/Key Words: Heart rate; Real time monitoring; Front crawl

Analysis of Ground Reaction Forces during walking in the different trimesters of pregnancy

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Resumo/Abstract:

Walking is a recommended physical activity during pregnancy, which involves biomechanical changes, that can alter a woman's balance and mobility, leading to an increased risk of falls (Kwiatkowska et al., 2024; Santos Rocha, 2020). Objective: To analyze the support reaction forces (SRF) during the gait cycle in the trimesters of pregnancy. Methods: 13 pregnant women with gestational ages between 9 weeks and 2 days and 36 weeks and 2 days (1st trimester, n=1; 30±0.0 years old; 2nd trimester, n=4, 30.5±4.0 years old; 3rd trimester, n=8, 34.4±3.6). Data was collected using the Phyphox application via a smartphone, and analyzed with GNU Octave Software. Results: In the 1st trimester, the peak anterior force is the highest. In the 3rd trimester, the peak of force in posterior direction is higher, probably due to the reduction in double support time. In the 1st trimester, the highest vertical force peak occurs in the middle stance phase, while in the remaining trimesters it occurs in the terminal stance phase. In the 1st trimester, the maximum peak in lateral forces and the minimum peak in medial forces occurred, perhaps because the woman was in the 5th month postpartum after the birth of her first child. Conclusions: The GRF varies throughout the trimesters, which may contribute to a decrease in stability during walking and, consequently, a greater risk of falling.

Palavras-chave/Key Words: Gait; Ground reaction forces; Pregnancy; Motor control

Analysis of intra-segmental coordination between trimesters of pregnancy during gait

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Resumo/Abstract:

In pregnancy, physiological, biomechanical and musculoskeletal changes lead to a change in gait pattern (Kwiatkowska et al., 2024; Santos Rocha, 2020). Walking is a means of locomotion, and a regularly recommended physical activity during pregnancy (Branco et al., 2016). Objective: To analyze the pattern of walking' intra-segmental motor coordination during the trimesters of pregnancy. Methods: 13 pregnant women with gestational ages between 9 weeks and 2 days and 36 weeks and 2 days (1 st trimester, n=1; 30±0.0 years old; 2 nd trimester, n=4, 30.5±4.0 years old; 3 rd trimester, n=8, 34.4±3.6). Data was collected using the Phyphox application on a smartphone, and processed with GNU Octave software (data cutting, filtering, and angular displacement). To analyze intra-segmental coordination, it was drawn a phase plot per subject. Results: There is high motor coordination, in the sagittal plane in all trimesters; in the frontal plane, in the 1 st and 2 nd trimesters; and, in the transverse plane in the 3 rd trimester, but only 2 of the 4 women. The least motor coordination occurred in the 3 rd trimester. Conclusions: Intra-segmental motor coordination during walking varies throughout the pregnancy's trimesters, probably influenced by biomechanical and musculoskeletal changes.

Palavras-chave/Key Words: Gait; Intra-segmental coordination; Pregnancy; Motor control.

Healthy Lifestyle Coach - Healthy Lifestyle Network Europe

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Resumo/Abstract:

Background: “Good health and well-being” are part of the United Nations’ Sustainable Development Goals (SDG 3). Unhealthy lifestyles are strongly associated with non-communicable diseases, reinforcing the need for combined interventions involving physical activity, healthy eating, and positive mindset. Promoting health literacy and lifestyle behavior change is therefore essential. **Purpose:** The Healthy Lifestyle Network Europe (HLNE) is a three-year European project (2023–2026) with eight full partners, funded by ERASMUS Sport (Grant no. 101133533; €400,000). It builds upon the previous project New Health 2022 (NH2022; 2020–2022), both aiming to improve citizens’ health behaviors through physical activity, nutrition, and mindset interventions. **Methods:** and **Results:** The NH2022 project created a solid foundation for HLNE by developing: EuropeActive’s Educational Standards for Healthy Lifestyle Promoters (HLPs) (EQF Level 2), a blended-learning HLP course (Exercise as Medicine, Food as Medicine, Brain as Medicine), and the free training of 163 HLPs. Additionally, it launched the New Health website (www.new-health.eu), a free app, an open Lifestyle Scan, 29 lifestyle videos, and an open-access eBook on lifestyle coaching. Building on these outcomes, HLNE will train 1,000 new HLPs to reach 50,000 citizens and develop a higher-level EQF qualification for Healthy Lifestyle Coaches (HLCs), validated by experts, accompanied by a new training program. **Expected Impact:** HLNE is expected to standardize lifestyle promotion across Europe, empower communities with accessible tools and education, and create a sustainable professional network. Its dissemination strategy will ensure scalability and long-term impact beyond the project’s lifetime.

Palavras-chave/Key Words: Healthy lifestyle; HLNE; New Health; European projects; ERASMUS+