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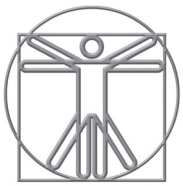

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MEETING ABSTRACTS

Abstracts from the 2nd Annual Scientific Conference of Physical Activity and Sports Tech for Healthy Lifestyles "Shaping the Future of Sports & Health Monitoring Systems": Podgorica, Montenegro. 16-19 October 2025

Edited by Stevo Popovic[1], Selcuk Akpinar[2], Miodrag Zarubica[3]

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Invited speakers

S1
CHALLENGES OF CONTEMPORARY WORLD - HOW MUCH ARE CHILDREN PHYSICALLY ACTIVE?

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Neurological research shows that physical activity stimulates neurogenesis, enhances synaptic plasticity, and supports memory and learning processes through the release of key neurotransmitters and growth factors. Regular exercise is also associated with reduced symptoms of anxiety and depression, improved stress resilience, and stronger social integration among children and adolescents. In contrast, the risks of physical inactivity are well documented, with sedentary lifestyles linked to childhood obesity, cardiovascular disease, and long-term health complications. Global data reveal an alarming rise in childhood obesity over the past four decades, presenting a major public health challenge. Particular attention is needed in early childhood (under 5 years), a critical developmental period for establishing motor competence, healthy behavior patterns, and long-term well-being. Environmental barriers such as urban density, limited access to safe play spaces, and increased screen time further reduce physical activity levels in preschool-aged children. In response, the SUNRISE International Study was launched to assess movement behaviors—including physical activity, sedentary behavior, and sleep—among children aged 3–4 years across diverse socio-economic and geographic settings. The study's primary objective was to evaluate adherence to the World Health Organization (WHO) Global Guidelines on Physical Activity, Sedentary Behaviour and Sleep for Children Under 5 Years of Age. Preliminary data from high-income countries show that only 5% to 24% of children meet all three guidelines concurrently. These findings underscore the urgent need for targeted interventions and policy reforms at both institutional and community levels. Elevating physical education as a foundational element of holistic child development is not only essential for health promotion but also a strategic priority for building resilient and capable future generations.

S2
CURRENT STATUS OF PHYSICAL ACTIVITY AMONG CHINESE ADOLESCENTS: GOVERNMENTAL SUPPORT MEASURES

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The objective of this study is to assess physical activity in Chinese adolescents, related health risks, and governmental initiatives for improvement. National surveillance data, relevant survey datasets, and policy document analysis were used to assess activity levels, health issues, and governmental initiatives among Chinese adolescents. Insufficient physical activity is a major issue among Chinese adolescents. Among those aged 7–18 years, only 55.9% engage in regular exercise, and 34.1% meet the recommended MVPA level. Physical literacy and participation decline with age; in upper primary grades, pass rates for physical literacy, motivation, and activity participation are 59.17%, 63.78%, and 3.95%, respectively. Despite its protective effects on health, low activity is linked to multiple risks, including scoliosis, overweight/obesity, visual im-

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pairment, and psychological distress, with higher burdens in western and rural areas. In response, the government has implemented four measures: strengthening school-based PE through teacher/facility investment, curriculum reform, and inclusion in entrance exams; fostering home–school–community collaboration; integrating sports with education and health systems; and prioritizing disadvantaged regions to improve access and equity. Insufficient physical activity remains a key barrier to improving Chinese adolescents' health. Priorities are to raise MVPA compliance through cross-sector collaboration, reform educational evaluation to allow more exercise time, advance student-centered programs, and target rural and western areas to link participation with better health outcomes.

S3
SUSTAINABLE SYNERGIES OF SPORT AND ACTIVE MOBILITY: CASE STUDIES FROM SERBIA

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The purpose of this study is to examine how cycling-based initiatives in Serbia foster sustainable sport tourism, local well-being, and new opportunities for health monitoring. Two case studies are examined: Tour de Fruška, a multi-day event combining cycling, nature, and culture, and EuroVelo 6, the Danube cycling route linking Serbia to the wider European network. The study used a comparative case study approach, which compared outcomes, stakeholder engagement, and alignment with national and EU policy about sustainable and healthy practices. Both case studies are models of the importance of cycling infrastructure, i.e., the organization of sports events, both in encouraging active mobility and measurable health practices, as well as the development of tourism and the rural economy. The sporting event Tour de Fruška attracted the attention of over 1500 participants with various races for all levels, from amateurs to professionals, and over 10,000 visitors. The EuroVelo 6 attracts annually more than 20,000 international cyclists, which contributes to increasing the number of overnight stays and boosting the rural economy by up to 35%. These case studies emphasize cycling's dual role as a living laboratory for health monitoring and a significant factor of sustainable tourism. This study is part of the Interreg Europe DEPART project - Support the Development of a Sustainable Sports Tourism in Europe (Reg. no. 02C0622).

S4
RELATIONSHIP BETWEEN ENVIRONMENTS OF SCHOOLS AND SURROUNDING AREAS AND PHYSICAL ACTIVITY IN CHILDREN

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As one of the children's main activity venues, school and its surroundings provide children with many opportunities to participate in physical activity (PA). Existing studies usually examine the school and its surroundings separately, while few research has investigated environments in and around schools as a whole. This study aimed to objectively measure environment in and around school, as well as PA of children within those environments, to investigate the impacts of school and surrounding environments on PA of children. Six schools and 360 4-6 grade children in Beijing were recruited. Environmental characteristics in schools and around schools (50m, 100m, 400m, 800m, and 1,000m buffers) were collected using IS-COLE and EAST-HK audit tools respectively. PA of children was measured with accelerometers. Linear mixed model was used to analyze relationship between school and surrounding environments and children's PA. For environments in school, feasibility of walking, feasibility of cycling, and sports and game facilities support are negatively associated with boys' PA in school; other facilities support and aesthetics are negatively related to girls' PA in school. For environments surrounding school, safety within 400m buffer is negatively related to PA of both boys and girls, and aesthetics within 1,000m buffer is positively associated with PA of both boys and girls. Improving the built environment in and around school is expected to promote children's PA in corresponding areas with attention paid to varied impacts of environment on boys and girls.

S5
GRAPH NEURAL NETWORKS FOR PREDICTING PROTEIN-PROTEIN AND DRUG-PROTEIN INTERACTIONS: A SYSTEMATIC REVIEW

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Investigating protein-protein and drug-protein interactions is crucial for understanding biological processes and discovering new drugs. Proteins can naturally be represented as nodes in graphs, with chemical bonds or interactions as edges. Similarly, drug-protein interaction networks can be also constructed with proteins and drugs as nodes, making them suitable for the application of powerful Graph Neural Networks (GNNs). This review analyzes GNN-based approaches due to their ability to capture structural and relational information, making them ideal for predicting unknown links in graphs (e.g., whether two proteins interact, or if a drug will bind to a protein target). A systematic review and comparative analysis of existing GNN-based methods was conducted. Since around 2019, dozens of studies have applied GNNs to protein-protein interactions networks. The most widely used methods includes Graph Convolutional Networks, GraphSAGE and Graph Attention Networks. Several models combine drugs, proteins, and diseases into joint heterogeneous graphs for link prediction. The most promising approaches are heterogeneous GNNs and more recent transformer–GNN hybrids. In protein–protein interaction prediction, GNNs have become one of the dominant methods in the last five years, applied in most state-of-the-art works. In drug–protein interaction prediction, GNNs consistently rank among the top-performing approaches.

S6
FORECASTING IN SPORTS AND ATHLETICS WITH TIME-SERIES FOUNDATION MODELS: A NEW PARADIGM FOR MULTIDISCIPLINARY APPLICATIONS

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Forecasting in sports, exercise, and health sciences plays a key role in enhancing performance, preventing injuries, and optimizing training. Data collected in athletics are predominantly time series, encompassing anthropometric measures (height, weight, body mass index, forearm circumference) and biometric indicators such as heart rate, workload, and recovery metrics. Traditional time-series forecasting approaches, including auto-regression models and recurrent neural networks (RNNs) such as GRU, LSTM, and Bidi-

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rectional RNNs, have contributed significantly. However, these approaches remain limited as they fail to capture long-term dependencies within data effectively, require extensive task-specific tuning, and generalize poorly across diverse contexts. The transformer architecture, based on the self-attention mechanism, has enabled efficient modeling of long-range dependencies within sequences while allowing significant parallelization and faster training. Building on this, time-series foundation models (TSFMs) represent a novel and transformative approach to time-series forecasting. Trained on massive and heterogeneous datasets, TSFMs excel at capturing data trends and seasonality, can transfer knowledge across domains, integrate covariates (additional channels), and, in some cases, provide confidence intervals for forecasts. The presentation will illustrate real-world applications of TSFMs in sports and athletics, underscoring their transformative potential in forecasting performance.

S7
RETHINKING POLITICAL NEUTRALITY

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This intervention critically examines the extent to which sports have become a terrain of geopolitical contestation. While the Olympic Charter constitutionally positions political neutrality as a cornerstone of global sport, its application has been inconsistent and frequently compromised by various drives, from political to commercial. From Cold War boycotts to contemporary disputes involving Russia, Ukraine, Israel, and Palestine, international sports organizations (ISOs) have applied neutrality selectively, often reflecting dominant geopolitical alignments rather than universal principles. At the same time, the rise of emerging and asymmetric actors from the Global South, China, and BRICS has challenged the traditional Western dominance of international sport governance. These dynamics expose the fragility of the concept in sustaining organizational autonomy and institutional stability, confirming the continuity of utilizing sport's potential for national building, branding, and soft power tool. Contemporary geopolitical shifts are central to global sport governance evolving to a more transactional its nature and operational. The theoretical framework is based on institutional theories, primarily reflecting the interplay of isomorphic and coercive practices shaping governing bodies and decision-making processes resulting often in organizational hypocrisy.

S8
THE ROLE OF PHYSICAL EDUCATION IN SHAPING HEALTH BEHAVIOR: EVIDENCE FROM HUNGARY AND SERBIA

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The study aimed to compare physical education within the compulsory school systems of Hungary and Serbia from the perspective of health education. Special emphasis was placed on the prevention of overweight and obesity among schoolchildren, highlighting the rising prevalence and identifying possibilities for improving lifestyle and long-term quality of life. A comparative analysis was carried out on the structure and content of physical education curricula, teacher training, and fitness assessment systems in both countries. In addition, national and international surveys on children's nutritional status and physical activity were reviewed, including WHO COSI data and regional studies conducted between 2014 and 2024. The findings reveal an increasing prevalence of overweight and obesity among children in both Hungary and Serbia, with every fourth Hungarian child and every third Serbian child affected. Hungarian reforms such as daily physical education and the NETFIT system show some stabilizing effects on fitness levels, while Serbian data indicate a continuing rise in overweight prevalence. Common risk factors include unhealthy eating habits, low physical activity, disrupted circadian rhythms, and excessive screen time. Schools and families play a crucial role in shaping preventive behaviors. Preventing childhood obesity requires coordinated action by schools, families, and communities. Comprehensive health education, daily physical activity, balanced nutrition, and digital awareness are essential elements. Comparative insights suggest that integrated, long-term interventions can improve children's health behavior and reduce obesity-related risks in both countries.

S9
VISCERAL OBESITY, HEALTH RISKS AND FINDINGS FROM THE MONS STUDY

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The aim of this study was to assess the prevalence of micronutrient deficiencies and nutrition-related noncommunicable diseases among women in Montenegro. Visceral fat, stored around internal organs, is metabolically active and strongly associated with insulin resistance, systemic inflammation, and elevated risk of cardiovascular disease and type 2 diabetes. The Montenegro Nutrition Survey (MONS) 2022 was conducted as a national cross-sectional study including children under 5 years, pregnant women, and women aged 15–49 years. Data collection combined laboratory analyses with anthropometric measurements, primarily waist circumference, to assess metabolic risk factors and components of metabolic syndrome. Findings revealed that over 10% of women suffer from metabolic syndrome, corresponding to an estimated 16,110 women of reproductive age in Montenegro. Among the syndrome's components, visceral obesity and low HDL cholesterol were the most prevalent, frequently accompanied by elevated triglycerides. More than 40% of women were identified with visceral obesity, increasing to over 60% in women aged 40–49 years. The clustering of visceral obesity, low HDL, and high triglycerides accounted for nearly half of all cases of metabolic syndrome. This combination is strongly predictive of cardiovascular disease and gestational diabetes. Visceral obesity emerged as a key driver of metabolic syndrome in Montenegro. Given its high prevalence and non-invasive diagnostic potential through waist circumference measurement, obesity should be prioritized as the primary screening indicator. Public health interventions targeting healthy nutrition, physical activity promotion, and behavior change are essential for reducing obesity and mitigating the burden of metabolic syndrome in Montenegro.

S10
HEALTH PROMOTION THROUGH THE CROATIAN NATIONAL PLATFORM: MONITORING STUDENTS' PHYSICAL FITNESS AND POSTURAL CHARACTERISTICS

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Since the 2024/2025 school year, a new approach to monitoring students' physical fitness and postural characteristics has been implemented in the Republic of Croatia as part of the national e-Dnevnik platform. e-Dnevnik is an electronic class register that has replaced paper registers in Croatian schools, enabling the modernization

and digitalization of the teaching process. The National System for Monitoring Students' Physical Fitness and Postural Characteristics is aligned with applicable legislation and curriculum documents, such as the Physical Education Curriculum and the Regulation on Pedagogical Documentation, which mandate the monitoring of physical fitness and posture. The purpose of the System is to improve health, develop physical literacy, and support data-informed educational and health decision-making. Monitoring is conducted using evidence-based procedures, with an emphasis on individual student progress rather than comparisons with peers, which strengthens intrinsic motivation and responsibility for one's own health. The assessment of physical fitness includes a series of tests (body mass, body height, waist circumference, handgrip strength, standing long jump, 4×10 m shuttle run, and the 20 m progressive shuttle run), each serving as a specific indicator of health. Particular attention is devoted to postural characteristics due to their prevalence and potential long-term consequences, with the aim of early detection of irregularities. Where such irregularities are observed, cooperation with parents and health professionals is encouraged. The screening has both pedagogical and health value, as it emphasizes collaboration among students, Physical Education (PE) teachers, parents, and the school and adolescent medicine specialist in the long-term care of students' health. The system is flexible and open to further evidence-based refinements, and its thoroughness contributes to improving the educational process and shaping sustainable public health policies.

S11
A MULTILEVEL CBPR APPROACH TO PROMOTE PHYSICAL ACTIVITY AND ADDRESS CHILDHOOD OBESITY IN RURAL HISPANIC COMMUNITIES

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Childhood obesity remains disproportionately high among rural Hispanic children in the U.S., yet most multilevel interventions using community-based participatory research (CBPR) have been conducted in urban contexts. This presentation introduces a CBPR-driven, multilevel intervention designed to increase physical activity (PA) and promote healthy lifestyles in rural Hispanic communities. Hispanic Children (n=653; ages 8–12) in the intervention group engaged in PA-focused strategies at multiple levels: comic books and group classes incorporating PA for children and families, classroom-based PA breaks and media literacy education at schools, and community-wide activities such as Family Night and an annual Ciclovía event, which reclaimed streets for walking, biking, and active play. The intervention was co-designed with community stakeholders to ensure cultural relevance and sustainability. Findings demonstrated a short-term, dose-response effect on reducing BMI z-scores and increasing daily PA among participants. Results highlight the potential of CBPR-based, multilevel strategies to foster active lifestyles and reduce obesity risk among rural Hispanic children. Future research should examine long-term effects and scalability to similar communities.

S12
NUTRITION LITERACY AND DIETARY HABITS AMONG YOUNG ATHLETES IN MONTENEGRO: A CROSS-SECTIONAL STUDY

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This study aimed to assess the level of nutrition literacy among young athletes in Montenegro and to explore associations with dietary habits, supplement use, and socio-demographic and anthropometric characteristics. A cross-sectional study was conducted among 172 athletes aged 15–35 from five Montenegrin municipalities. A structured questionnaire collected data on demographics, anthropometrics, dietary habits, hydration, supplement use, and included 50 items measuring nutrition literacy. Correct answers were scored (0–50 points) and categorized into low (<50%), moderate (50–59%), and satisfactory (≥60%) literacy levels. The average nutrition literacy score was 20.74 ± 7.12 out of 50 (41.5%), indicating a generally low level of knowledge. Only a small number of participants achieved satisfactory scores. Female athletes scored significantly higher than males ($p < 0.05$), especially in hydration and micronutrient knowledge. Athletes who had consulted a nutritionist performed significantly better ($p < 0.01$). Most respondents (92%) had never attended a structured nutrition course. Unhealthy eating patterns, frequent fast-food intake, and unsupervised supplement use (reported by 46% of athletes) were common. Coaches, peers, and online platforms were dominant sources of nutrition information, while certified professionals were rarely consulted. Findings reveal substantial gaps in nutrition knowledge and dietary behaviors among Montenegrin athletes. The results highlight the need for expert-led education and improved integration of nutrition professionals in sports settings.

S13
IS AGING A DISEASE OR A NATURAL PROCESS? INSIGHTS FROM BIOLOGY, EPIDEMIOLOGY, AND LIFESTYLE INTERVENTIONS

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The classification of ageing remains debated: whether it should be considered a natural physiological process or a pathological state akin to disease. This work explores perspectives from biology, epidemiology, and lifestyle medicine to clarify the implications of defining ageing and to highlight the importance of biological age as a marker of health. A narrative synthesis of key literature was conducted, including the World Health Organization's framework on healthy ageing, arguments for ageing as a disease, critiques of medicalization, mechanistic vascular studies, and recent research on biomarkers and interventions. Epidemiological data linking resting heart rate, physical activity, and mortality were also considered. Evidence shows that ageing is associated with progressive vascular and cellular changes, overlapping with mechanisms of chronic disease. Chronological age is an inadequate predictor of health outcomes, whereas biological age better reflects functional capacity and mortality risk. Epidemiological studies demonstrate that lower resting heart rate, common in physically active individuals, correlates with reduced cardiovascular morbidity and overall mortality, consistent with interspecies patterns linking fewer lifetime heartbeats with longer lifespan. Lifestyle interventions, including physical activity and nutrition, show measurable effects on decelerating biological ageing. Ageing is best understood as a physiological continuum with disease-related features rather than a discrete pathology. Recognizing biological age and promoting healthy lifestyle behaviors are critical for reducing morbidity, extending healthspan, and guiding personalized interventions.

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S14
THE ROLE OF SPORTS AND PHYSICAL EDUCATION IN THE PREVENTION OF SPORTS BETTING AMONG ADOLESCENTS

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Sports betting can create a serious addiction in people, especially adolescents. The creation of a new normality that includes an increasing number of betting shops in settlements, even next to schools and kindergartens, as well as a media space flooded with intensive advertising, indicate the urgency of solving this problem. The aim of this study is to review the available literature on research related to the role of sports and physical education in the prevention of adolescent addiction to sports betting. Specific key words "sport", "physical education", "adolescents", "sports betting", "youth addiction", were used to search relevant electronic databases, such as PubMed, Web of Science and Scopus and regional sources from the Balkans. Studies that fit the inclusion criteria such as containing the data with the publication time that was from 2015 to 2025, shows that physical activity carried out through sports or physical education together with an adequate, targeted educational program can significantly influence the reduction of risky behavior and risk factors. In solving this problem, sports and physical education can make a great contribution, but only in combination with educational programs aimed at probabilistic media literacy of adolescents and regulatory measures in sports institutions.

S15
A CORRELATION ANALYSIS OF OBESITY PARAMETERS AND MOTOR COORDINATION IN EARLY SCHOOL-AGE CHILDREN

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Childhood obesity has emerged as a major public health challenge with implications for physical, cognitive, and psychosocial development. Understanding the relationship between obesity parameters and motor coordination at early school age is important for informing interventions in school and community settings. The purpose of this study was to investigate the associations between two anthropometric indicators of obesity (body weight and waist circumference) and four measures of motor coordination (jumping sideways, walking backwards, hooping height, and moving sideways) in first- and second-grade children. A cross-sectional study was conducted with 176 children aged 6–8 years. Body weight and waist circumference were measured following standardized protocols. Motor coordination was assessed using four subtests of the Körperkoordinationstest für Kinder (KTK). Pearson correlation coefficients were calculated to explore the associations between obesity indicators and coordination outcomes. Body weight showed weak and non-significant correlations with all coordination tasks: jumping sideways ($r = -0.035$, $p = .641$), walking backwards ($r = -0.140$, $p = .065$), hooping height ($r = .010$, $p = .896$), and moving sideways ($r = -0.066$, $p = .381$). In contrast, waist circumference demonstrated stronger negative correlations. A significant association was found with walking backwards ($r = -0.278$, $p < .001$), while correlations with moving sideways ($r = -0.146$, $p = .054$), jumping sideways ($r = -0.125$, $p = .099$), and hooping height ($r = -0.129$, $p = .088$) approached but did not reach statistical significance.

S16
SOCIAL-EMOTIONAL LEARNING AND MENTAL HEALTH BENEFITS OF SCHOLASTIC ESPORTS

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Esports is often framed through a lens of entertainment or competition, yet emerging evidence demonstrates its value as an educational and developmental tool. This invited presentation highlights findings from multiple scholastic esports programs implemented through the Network of Academic and Scholastic Esports Federations (NASEF), with a focus on social-emotional learning (SEL) outcomes and student mental health. Data were synthesized from diverse sources, including grant-funded program evaluations, district-level reports, and independent assessments of NASEF-affiliated programs. Measures included school attendance, student surveys on SEL skills, qualitative coach and teacher feedback, and district case studies documenting changes in student engagement and well-being. Across schools and districts, scholastic esports participation was associated with positive outcomes in teamwork, communication, and leadership. Students reported improvements in belonging and confidence, while educators noted reductions in social isolation and increases in classroom participation. District-level data highlighted improved attendance rates and higher levels of extracurricular involvement among esports participants, particularly for students who were not previously engaged in school athletics or activities. Scholastic esports provides an accessible, low-barrier platform for fostering SEL and supporting student mental health. By combining structured team play with mentorship and school-based supports, esports programs create opportunities for connection, skill-building, and resilience. The accumulated evidence suggests that integrating esports into school systems can contribute meaningfully to student well-being and should be considered a valid component of comprehensive youth development strategies.

S17
SYMMETRICAL MOTOR PERFORMANCE IN RIGHT-HANDED COMPETITIVE TABLE TENNIS PLAYERS

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Table tennis is typically a unilateral sport, and long-term specialized practice might be expected to produce interlimb asymmetries in motor control. Understanding whether such sport-specific practice leads to measurable differences between dominant and non-dominant arms provides insight into sensorimotor adaptation and neural modulation associated with high-level skill. This study examined whether right-handed competitive table tennis players show asymmetries in motor performance during a reaching task that depends on proprioception and reaction time. Right-handed table tennis players aged 18–30 years (rankings ~30–200) performed a bilateral reaching task with both dominant (right) and non-dominant (left) arms. Outcome measures included movement accuracy, hand-path deviation from linearity, movement speed, and reaction time. Comparisons between arms were conducted using paired analyses; significance was evaluated at the .05 alpha level. No statistically significant asymmetries were observed between the right and left arms across all

measured variables. The right (dominant) arm showed non-significantly better movement accuracy and reduced hand-path deviation from linearity, while the left arm showed a non-significantly faster reaction time. Effect sizes were small and did not indicate meaningful interlimb differences. Despite the predominantly unilateral demands of table tennis, right-handed competitive players in this sample did not exhibit statistically significant motor-performance asymmetries in a proprioceptive reaching task. Although the left (non-dominant) arm showed a slightly faster reaction time, this difference did not reach significance; nevertheless, a faster non-dominant reaction time could conceivably confer a tactical advantage in fast, unpredictable rallies by improving response readiness to unexpected stimuli. For context, among the top-20 ranked players, left-handedness prevalence was ~20% in female and ~25% in male players. These findings suggest that bilateral sensorimotor function may be preserved in competitive players or that sport-related neural adaptations help minimize interlimb differences. Future work should use larger samples and neurophysiological measures to assess whether subtle reaction-time differences translate to on-table competitive advantages.

S18
PHYSICAL FITNESS AND EXECUTIVE FUNCTIONS IN EARLY CHILDHOOD: A SYSTEMATIC REVIEW OF RECENT EVIDENCE

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Optimizing physical activity (PA) levels and developing executive functions (EFs) is of great importance in preschool children. The link between physical fitness (PF), obtained through repetitive PA, and EFs is gaining increasing attention in recent years and we sought to systematically search the literature on the relationship between PF and EFs in preschool children published in the last five years. Web of Science, Scopus, and PubMed were databases searched for the relevant literature. Original studies written in English and published in peer-reviewed journals including healthy children aged 3-6 years who were simultaneously tested for PF and EFs were considered eligible. To ensure transparent and accurate reporting we followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. Investigation was prospectively registered in the International Prospective Register of Systematic Reviews (PROSPERO) database (CRD420251072802). A total of 20 studies (n=3117, age=4.9±0.6 years) were included in the final analysis. Aerobic fitness was consistently associated with better EF outcomes. Body composition, muscle strength, and flexibility were not associated with aspects of EF. Agility, speed, and power were positively associated with the parameters of working memory. The dynamic component of balance was correlated with greater values of inhibitory control. The link between agility, speed, power, and the static component of balance with inhibitory control was quite inconsistent. Similarly, conflicting evidence was observed regarding the association between dynamic and static balance with working memory aspects. Aerobic fitness appears to play a significant role in EF development, while the relationship between other components of PF and EFs seems less clear. Kindergartens are uniquely positioned to nurture children, making them ideal for promoting the development PF and EF development through intentional, play-based, and developmentally aligned experiences.

Oral presentations

O1
TMJ AND SPORTS ENHACEMENT

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Despite its anatomical and neurological relevance, the temporomandibular joint (TMJ) is rarely considered in athletic performance contexts. This study aims to raise awareness about the TMJ's functional impact on sports performance, introduce the concept of neuromandibular regulation, and propose a neurobiomechanical framework for future interdisciplinary research. A multidisciplinary review of current literature was conducted, focusing on the neurophysiological links between mandibular positioning and motor system efficiency. Special emphasis was placed on the trigeminal nerve's influence on sensorimotor integration, cervical spine posture, muscle recruitment, and reaction time modulation. Preliminary biomechanical modeling and clinical observations were also analyzed to illustrate potential mechanisms. Findings suggest that mandibular alignment and TMJ function can significantly impact postural control, muscular coordination, and neuromuscular responsiveness. The trigeminal nerve appears to play a central role in regulating body symmetry, muscle tone, and motor reactions—critical factors in athletic performance. The TMJ may have a more influential role in sports performance than previously recognized. Although empirical evidence in sports populations remains limited, the presented neuroanatomical and biomechanical foundations open promising directions for interdisciplinary research, clinical applications, and innovative performance optimization strategies.

O2
THE ROLE OF PSYCHOLOGY IN PROFESSIONAL FOOTBALL: A QUALITATIVE STUDY ON MENTAL PERFORMANCE AND PLAYER WELL-BEING

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Sports psychology plays an increasingly important role in professional football, contributing to mental resilience, focus, leadership, and emotional control. Many elite teams now integrate psychologists into their coaching staff to enhance individual and team performance, manage stress, prevent injuries, and support player rehabilitation. This study investigates the role of psychologists within football teams by exploring the specific functions they serve, the relative benefits of psychologists versus psychiatrists, the most common mental health challenges faced by players, and the impact of psychological support on overall team performance and player development. A qualitative research approach was employed, using in-depth interviews with 25 psychologists affiliated with top European football clubs. Participants included leading professionals such as Dr. Eric Matser, former team psychologist at Chelsea FC under

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Coach José Mourinho. Interviews were conducted across 25 sessions. The findings indicate that a player's mental condition can significantly influence match outcomes, and that psychological skills training supports key areas such as commitment, communication, concentration, control, and confidence. Mental health concerns are prevalent in football but are often under-addressed. Psychologists play a vital role in psychosocial development, injury prevention, emotional regulation, and performance optimization. Ongoing psychological support enables players to build on their strengths and address weaknesses. Overall, psychologists are integral to modern football teams, offering valuable expertise that enhances mental performance, supports holistic player well-being, and contributes to long-term health, team cohesion, and injury recovery.

O3

EXPLORING SEDENTARY AND NUTRITIONAL BEHAVIOUR PATTERNS IN RELATION TO OVERWEIGHT AND OBESITY AMONG YOUTH FROM DIFFERENT DEMOGRAPHIC BACKGROUNDS IN SAUDI ARABIA

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The prevalence of overweight and obesity has increased over the last three decades, becoming a major public health concern, particularly in the Kingdom of Saudi Arabia (KSA). This study aimed to explore the nutritional and lifestyle habits of youth in the Al-Ahsa region of the KSA. A cross-sectional design was used, involving 1,270 secondary-school boys and girls (aged 15–19 years) from all five districts of the Al-Ahsa Governorate. Body mass index (BMI) and waist circumference were assessed through anthropometric measurements, while the Arab Teens Lifestyle Survey (ATLS) was used to evaluate sedentary behavior and dietary habits. Chi-square analysis revealed that a higher proportion of females (90.68%) than males (79.18%) exceeded two hours of daily sedentary time. Frequent sugary drink consumption (more than three times per week) was similar among males (67.40%) and females (66.11%). Significant geographic differences were observed in the frequency of fast food ($\chi^2 = 24.503$), cakes/doughnuts ($\chi^2 = 8.414$), sweets/candy ($\chi^2 = 19.613$), and energy drink consumption ($\chi^2 = 21.650$). These findings highlight the urgent need for targeted health interventions and policy actions to address poor lifestyle behaviors and the growing obesity risk among youth in Al-Ahsa.

O4

COMPARING HUMAN AND AI COACHING IN TRIATHLON FRONT CRAWL SWIMMING: A VIDEO-BASED ANALYSIS

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Integrating artificial intelligence (AI) into sports coaching is transforming how athletes receive feedback and optimize performance. In endurance sports such as triathlon, where technical efficiency is critical, comparing AI-generated analysis with human expertise offers valuable insights into personalized training. This study aimed to compare the quality and scope of technique analysis provided by experienced triathlon coaches and an AI-based system (ChatGPT-4o) in evaluating front crawl swimming performance. Fifteen certified coaches and one AI model analyzed a 25-frame video sequence of an intermediate-level triathlete performing a complete front crawl cycle, providing prioritized error identification and correction suggestions. All feedback was categorized using a deterministic biomechanical model of swimming performance. The AI model had been trained on over 200 annotated training sessions and relevant literature. Both human and AI coaches identified key biomechanical errors, particularly in the catch phase and elbow positioning. While human coaches emphasized breathing, body alignment, and leg movement, the AI focused on micro-angular deviations and stroke symmetry. The AI offered more detailed and consistent feedback, prioritizing errors based on their impact on propulsion and energy efficiency, whereas human coaches contributed context-sensitive insights, particularly relevant to open-water conditions. The AI demonstrated high reliability and depth in identifying technical errors, and when combined with the experiential knowledge of human coaches, a hybrid approach appears to offer the most comprehensive and individualized training strategy for triathletes.

O5

THE ROAD TO A SELF-DIRECTED LEARNER IN PHYSICAL EDUCATION: A DIGITAL REALITY COMPATIBLE PEDAGOGY

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As digital technologies reshape educational environments, physical education must evolve to support learner autonomy and adaptability. This study explores how pedagogical models such as self-directed learning and self-regulated learning can be effectively integrated into physical education through digital tools and flipped classroom strategies. The aim is to evaluate the compatibility of independent learning models with digital platforms to enhance learner autonomy, motivation, and competence. A qualitative, conceptual approach was used, synthesizing literature and practical implementations from secondary education. Case examples included app-supported video analysis for motor skill development and student-led fitness planning, illustrating how digital tools can facilitate independent learning in physical education. Findings suggest that a pedagogy combining current digital tools with autonomy-supportive teaching, peer collaboration, and formative feedback can significantly foster self-directed learning behaviors. Flipped instructional sequences and technology-mediated feedback were found to reduce learner dependence on the teacher while promoting accountability, creativity, and physical engagement. Overall, integrating digital tools with self-regulated learning strategies in physical education offers a promising path toward cultivating independent, motivated, and lifelong learners.

O6

EXPLORING THE LINK BETWEEN HS-CRP WITH BODY COMPOSITION AND MUSCLE FUNCTION DECLINE

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Low-grade systemic inflammation, detected by high-sensitivity C-reactive protein (hs-CRP), may influence body composition, muscle function, and physical performance in aging popula-

tions. While existing literature suggests a potential association between inflammatory markers and musculoskeletal decline, comprehensive analyses remain scarce and inconclusive. This study investigated the relationships between hs-CRP levels, adiposity, muscle strength, and functional performance in community-dwelling middle-aged and older adults. A cross-sectional sample of 283 participants (153 females) aged 40 years and older from Kosovo was assessed. Participants underwent anthropometric measurements, body composition analysis via bioelectrical impedance analysis (BIA), blood serum testing using immunoturbidimetric analysis, isometric handgrip dynamometry, and several physical performance assessments including the chair stand test, arm curl test, usual and fast-pace gait speed, timed up-and-go (TUG), and the six-minute walking test (6MWT). Elevated hs-CRP levels were significantly associated with higher body mass, BMI, body fat mass (BFM), and fat percentage (BFP), along with lower lean mass percentage ($p < 0.001$). Functional limitations were observed in participants with elevated inflammation, particularly in the chair stand ($p = 0.018$) and TUG ($p = 0.026$) tests. Among females, higher hs-CRP levels were linked to slower fast-pace gait speed ($p = 0.044$) and reduced 6MWT distance ($p = 0.001$), with no significant differences observed in males. Regression analyses identified BFM and female sex as key predictors of chronic low-grade inflammation ($p < 0.001$). These findings suggest that elevated hs-CRP is associated with increased adiposity and impaired physical functioning, especially among females. Further research is needed to explore additional inflammatory biomarkers and uncover causal pathways linking inflammation to physical decline.

O7
WOMEN'S PARTICIPATION IN LEISURE-TIME SPORT IN POLAND. CASE OF CHESS.

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Chess as a codified and institutionalized competitive game requiring special training to achieve improving results should be considered a sport. This discipline enjoys a relatively high level of interest in Poland; currently about one hundred thousand people (registered with the Polish Chess Federation) systematically practice amateur chess. However, the low share of women is intriguing (only 25% of players are female according to the Central Statistical Office in 2022). The goal of the study will be to describe and explain women's amateur chess activity. A standardized analysis of online data (desk research) was conducted on two nationwide random samples of amateur-open chess tournaments in Poland. The samples consisted of N=367 (2023) and N=366 (2024) records (95% confidence level and 5% maximum error). Women manifested relatively lower level of performance than men. The share of women in Polish chess tournaments was between 16% and 19%. The share of women was higher for tournaments (1) with a lower average ranking; (2) with a lower overall number of participants; (3) played at a different pace than blitz. Female players were generally 5-7 years younger than male players and placed in the junior age category. The lower results obtained (perhaps due to less commitment) lead women to self-restraint (choosing lower-ranked, "easier" tournaments) and to abandon chess early (after reaching adulthood).

O8
THE IMPACT OF THE MAMANET CACHIBOL LEAGUE INTERVENTION PROGRAM ON THE PERCEIVED HEALTH STATUS, MENTAL HEALTH AND HEALTHY LIFESTYLE OF ARAB

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The Israeli Mamanet Cachibol League (MCL) is a community-based sports program that serves mothers through participation in non-competitive recreational sports. The aim of this study was to examine the effects of MCL on perceived health status, mental health (happiness, depression, social capital), and healthy lifestyle behaviors (physical activity and diet). This is an experimental study with a sample of 231 women (174 in the experimental group and 57 in the control group). Participants completed questionnaires in November 2023 (T1) and subsequently in August 2024 (T2). The questionnaire contained questions on sociodemographic characteristics, perceived health status, mental health (happiness, depression, social capital) and healthy lifestyle (physical activity and diet). At T1, MCL participants reported better mental health (higher subjective happiness and (higher subjective happiness and social capital and lower depressive symptoms) than the control group. Over time, participation in MCL led to significant improvements in mental health (decrease in depression and increase in subjective happiness and social capital). Participants showed significant improvements in healthy lifestyles, with moderate effect sizes (effect size > 0.5) observed in these areas. Sociodemographic factors influenced the results, with differences in health perception and physical activity related to marital status and education level. Participation in the MCL program was associated with better mental health at baseline and improved significantly over time compared to the control group. MCL participants also showed an increase in healthy lifestyle habits, highlighting the importance of tailored interventions.

O9
MEDIA COMMUNICATION IN RAISING AWARENESS ABOUT SPORT'S ACTIVITIES AND IMPACT OF QUALITATIVE OF LIFE

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Media communication strategies are important for raising awareness about recreational sports activities and their impact on quality of life for all generations. Media are a platform for sending messages about the importance of recreational sports activities and their impact on quality of life. It is important to go to exams and talks with physicians in order to define health condition, diet, sports activities, and the plan of sports activities. It is important to have confidence in physicians with different specializations, in sports instructors, and in the support of friends and family. In the paper, special focus will be given to generation segmentation for taking care of sports activities. A special aspect will be the analysis of the impact of sports on quality of life. A unique aspect will be storytelling about fitness culture and the importance of fitness. It is very important to raise awareness that a good lifestyle gives a chance for quality life. The goal of the paper is to research the theoretical approach of media communication in raising awareness about rec-

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reational sports activities for quality of life. After the theoretical review, the paper will present case studies. Using in-depth interviews with physicians, professors of sports, professional sports instructors, physiotherapists, journalists, and media creators, the paper will give opinions about the effectiveness of sports, rehabilitation, and relaxation on quality of life. Results indicate that media communication influences raising awareness about sports activities for quality of life. The findings prove that media communication raises awareness about the importance of sports for quality of life.

O10
SWIMMING AS A MODEL FOR IMPROVING SOCIO-HEALTH ASPECTS (MENTAL, PHYSICAL AND SOCIAL) AND WELL-BEING WHERE CHILDREN WITH DISABILITIES FROM 1ST TO 3TH GRADE IN PRIMARY SCHOOLS

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Children with disabilities were divided into three groups according to protection protocols and MKF certificate. The practical activity took place in the private sports facility pool located in city of Skopje, and practical activities was realized by sports educators from Faculty of physical education, sports and health, Ss Cyril and Methodius University in Skopje. This research was conducted through a special survey questionnaire that was distributed at the beginning of the project to the parents of children with disabilities, in order to determine the diagnosis of each of them separately and to obtain relevant data from this research. This is one of the few studies on children with disabilities and their physical activity in order to maintain their socio-health aspects as a mental, physical and social health also well-being. The pilot project took place over a period of three months from 15th/11/2023 to 15th/02/2024 year, in this project actively attended 25 children who have different type of disability. The results were processed with the statistical program SPSS through which several conclusions were submitted in order to improve the situation in which children with disabilities and their parents find themselves.

O11
THE USE OF ARTIFICIAL INTELLIGENCE IN MONITORING THE PSYCHOLOGICAL STATE OF ATHLETES

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The aim of this paper is to review recent literature on how Artificial Intelligence (AI) can be applied in monitoring the psychological state of athletes and the wider population. Machine learning, deep learning, and large language models are already used for mental health assessment. AI enables analysis of psychological, biomechanical, and behavioral data in real time. The review included recent interdisciplinary studies on AI technologies in wearable devices for evaluating psychological and mental states. Covered areas include human activity recognition, fatigue monitoring, biometric classification, and predictive models applied through smart devices. AI models, including CNN-LSTM, reached around 90% accuracy in classifying stress and fatigue using wearables. Compared to single-sensor approaches, AI improved anxiety prediction by 18% by combining activity and psychological metrics. These models also enable early detection of burnout, allowing coaches to intervene and lowering dropout rates among athletes. The psychological state of athletes is gaining attention, and AI offers new opportunities for monitoring and support. Beyond data collection, AI systems can provide actionable insights for coaches and medical staff. Key challenges remain: protecting privacy, avoiding algorithmic bias, and defining the role of AI in professional workflows. If addressed, AI could significantly improve athlete well-being and performance.

O12
BIOMECHANICAL PROFILES OF MALE AND FEMALE SWIMMERS: FORCE PLATFORM AND ISOMETRIC EVALUATION OF NEUROMUSCULAR PERFORMANCE

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Strength, power, and inter-limb asymmetries are critical for swimming performance and injury prevention, and modern technology enables precise evaluation of these qualities. This study aimed to examine gender differences in neuromuscular performance among elite swimmers using VALD Performance technology. Thirty elite Icelandic swimmers (11 males) completed countermovement jumps and isometric mid-thigh pulls on ForceDecks, hip abduction and adduction testing on the ForceFrame, and hamstring strength assessments on the NordBord. Independent samples t-tests were used to compare male and female athletes across kinetic and kinematic variables. Male swimmers demonstrated significantly higher body mass, jump height, concentric force and velocity, rate of force development, and peak vertical force ($p < .05$). Female swimmers exhibited greater eccentric peak velocity, reflecting reliance on deeper, faster countermovement. No sex differences were observed in countermovement depth, early force production (100 ms), or hip adduction/abduction strength. Male swimmers displayed superior explosive power, while females emphasized eccentric velocity to optimize performance. These findings suggest that training should be sex-specific—focusing on power development for females and efficiency refinement for males—when applying VALD Performance assessments in swimming.

O13
BODY MASS INDEX AND BODY FAT PERCENTAGE AMONG FIREFIGHTERS OF DIFFERENT AGE GROUPS IN MONTENEGRO

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Firefighting imposes extreme physical and psychological demands. Elevated body mass index (BMI) and high body fat percentage (FAT%) may impair operational performance and increase cardiometabolic risk. This study provides the first comprehensive, age-stratified analysis of BMI and FAT% among professional firefighters in Montenegro. A cross-sectional sample of 148 career firefighters (mean age 35.4 ± 11.3 years; range 20–60 years) from nine municipalities (Budva, Danilovgrad, Kolašin, Kotor, Mojkovac, Nikšić, Plužine, Podgorica, Žabljak) was assessed between April 2024 and February 2025. Anthropometric measures includ-

ed body height, weight, and pectoral, abdominal, and front-thigh skinfolds. BMI was calculated (kg/m²), and FAT% esti-mated via the Jackson & Pollock three-site equation. One-way ANOVA with LSD post-hoc tests and MANOVA examined age-group differences (seven categories: < 25, 25–29, 30–34, 35–39, 40–44, 45–49, ≥ 50 years). Mean BMI and FAT% were 28.05 ± 4.44 kg/m² and 21.12 ± 8.15 %, respectively—both in the over-weight/above-average ranges. Both indicators increased significantly with age (BMI: $F=3.071$, $p=0.007$; FAT%: $F=4.735$, $p<0.001$), with marked differences between firefighters < 30 years and those ≥ 35 years. While BMI plateaued after age 45, FAT% continued to rise, suggesting age-related lean-mass loss. A majority of Montenegrin firefighters exceed recommended BMI and FAT% thresholds, with a clear age-related deterioration in body composition. We recommend implementing routine, career-long monitoring of body composition, coupled with targeted fitness and nutrition interventions, to enhance operational readiness and long-term health.

O14
EFFECTS OF DAILY MULTIMODAL COMPREHENSIVE TREATMENT IN A SPA SETTING ON ANKYLOSING SPONDYLITIS PATIENTS IN IGALO, MONTENEGRO: A 3-WEEK STUDY

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The study aimed to evaluate the impact of a 3-week daily multimodal comprehensive treatment in a spa setting (MCTS) on various aspects of ankylosing spondylitis (AS) patients. A prospective study was conducted with 217 AS patients (167 males and 50 females) with an average age of 47.81 years. The MCTS program included physiotherapy (PT), occupational therapy (OT), and cognitive behavioral therapy (CBT). The personalized PT program consisted of tailored kinesitherapy, balneotherapy, massages and electrotherapy or sonotherapy. The results indicated significant improvements in spinal mobility, functional ability, disease activity, and overall well-being. Functional assessment scores (BASFI, BAS-G, Patient Global Assessment, Tender and Swollen Joint Count) significantly improved after the 3-week MCTS program ($p<0.01$). Spinal mobility parameters (occiput-to-wall distance, respiratory index, Schober's test and BASMI score) also showed significant improvement ($p<0.01$). Disease activity measures (BASDAI, ASDAS, morning stiffness duration, fatigue and pain levels) and the use of painkillers and NSAIDs decreased significantly post-MCTS ($p<0.01$). ASAS 20 response was achieved in 84.33% of patients after the program. In conclusion, the 3-week daily MCTS program led to notable improvements in AS patients' health and reduced the need for pain medication.

O15
IMPLEMENTATION OF DIGITAL TECHNOLOGIES FOR SCREENING AND PREVENTION OF CARDIOVASCULAR DISEASES (DIGI4CARE PROJECT - PILOT1)

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The main objective of the present study is to implement and evaluate the application of a telemedicine station in the work of general practitioners for early detection and diagnosis of cardiovascular diseases. The study is conducted within the framework of the international DIGI4Care Project - Pilot1. It is held in the period June 2025 - November 2025 in a Medical Centre in Sofia, Bulgaria. 250 patients (aged from 40 to 70 years) were examined. A certified Hubis telemedicine station was used, which automatically collects and processes the data. The following data were measured and analyzed for each patient: ECG; blood pressure; oxygen saturation (SpO2); temperature; routine urinalysis; glycated hemoglobin (HbA1c); lipid profile - total cholesterol (TC), HDL, LDL, TG. The data is automatically processed by the system and registered in the patient's records, where the risk profile is highlighted. The general practitioner receives a summary in the patient's electronic record. Screening programs based on telemedicine technologies provide new perspectives for effective diagnosis and prevention of cardiovascular diseases. Acknowledgements: This study was funded by Interreg Danube Region Project: Digital Medical technologies reshaping the DR Healthcare systems throughout the patient journeys from prevention to rehabilitation (DIGI4Care).

O16
ATTITUDES OF NURSING AND MIDWIFERY STUDENTS TOWARDS THE NEED FOR TELECARE TRAINING

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The aim of the study is to explore the opinions and attitudes of Nursing and Midwifery students regarding the need for telecare training. The shortage of nurses in healthcare and the growing demand for care are a huge challenge for health systems around the world. Including the provision of remote care as telecare in the practice of nurses would significantly ease their workload. A survey was conducted via Google Forms among 106 Nursing and Midwifery students of the Medical University of Plovdiv. The software product SPSSv.23 was used for statistical processing of the results. Only 17.00% of students are familiar with telecare applications in their professional field; 40.60% believe that it is important to study telecare; for 44.30%, the training would improve their future professional skills; 50.00% would include the provision of telecare in their future practice. The lack of awareness among students in the field of telecare, as well as the interest shown in its future use, highlights the need to include telecare as a studied discipline in their course of academic study.

O17
PHYSICAL ACTIVITY AND NUTRITIONAL HABITS OF EARLY- AND PRESCHOOL-AGED CHILDREN AND THEIR PARENTS

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The period of early and preschool age is very important in shaping children's health habits. The parents' approach to physical activity and nutritional habits is important for long-term behaviour patterns in children. The aim of this study is to determine the relationships between physical activity, nutritional habits and nutritional status of early- and preschool-aged children and their parents. As many as 262 parents completed a questionnaire on their early- and preschool-aged children's nutritional habits and another on children and parents' physical activity. The children

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and parents' level of nutrition was determined by body mass index (BMI). The results show that parents decide on the size of meals and the choice of foods included in the daily nutrition of children and are satisfied with the quality and size of meals that children consume during their stay in kindergartens. A significant correlation was found between the physical activity of children and their parents, as well as the level of nutrition. No statistically significant differences were found between early- and preschool-aged girls and boys. The results obtained show that parents play a key role in creating healthy lifestyle habits and encouraging physical activity of early and preschool children.

O18
THE ROLE OF STRETCHING IN IMPROVING PHYSICAL HEALTH AND PREVENTING INJURIES IN VOLLEYBALL TRAINING SESSIONS

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Stretching is an essential component of physical preparation that helps improve muscle elasticity, reduce cramps, and increase flexibility. This study analyzes the effects of stretching on injury prevention and performance improvement in volleyball by comparing athletes who include stretching in their training routine to those who do not. The study involved 32 athletes (beginners and professionals) divided into two groups over a 3-month period. Data were collected through self-reported questionnaires, observation, and analysis of medical records. Results showed that the use of stretching reduces injury incidence, improves flexibility, and accelerates recovery, especially among experienced male athletes. Athletes who did not practice stretching had a higher number of injuries and longer rehabilitation times, while females showed a tendency for more injuries and slower recovery. The study highlights stretching as a key component for injury prevention and faster recovery, especially in athletes with varying experience levels.

O19
A COMPARATIVE STUDY OF MOTOR SKILLS IN CHILDREN ACROSS SELECTED SPORTS DISCIPLINES

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For many years, martial arts have been used as a form of sport, as well as a recreational activity and self-defense. The increase in physical abilities comes as a result of the application of well-organized martial arts programs, however, the results are not very clear. The purpose of this study is to examine and identify the differences between athletes of various sports, including children aged 8-12 years (football, basketball and karate) in the teams training in Tirana. Children aged 8-12 years who participate in sports in three disciplines (soccer N=36, basketball N=25 and karate N=22) participated in this study. These children were measured for motor and anthropometric abilities as referred to below in the test protocols. Body weight and height, BMI - calculation, Waist Perimeter, Avenger dominant hand, Strength of the upper limbs - floor pump, Strength of the lower limbs - Long jump from place, Flexibility - Sit and Reach test and Agility - 10x5m test and T test. In this study, basic descriptive statistics (Mean, SD, Min, Max) were calculated for all studied variables and ANOVA analysis to obtain comparative results. The threshold of significant statistical difference is set at the 95% probability level, p=0.05. This study comes to the conclusion that children of school age 8-12 years who participate in team sports (basketball, football and karate), have significant changes only in some motor skills: Body weight - basketball, revenge Dominant Hand - basketball, strength lower limbs - football (long jump test from the place), agility - football (10x5m test) and agility - football and basketball (T test). This study presents necessary information for every coach and teacher of physical education. For future studies, it is recommended to consider other variables, especially that of cardiorespiratory fitness.

O20
INFECTIOUS DISEASES AMONG ATHLETES IN TIRANA: A CROSS-SECTIONAL STUDY ACROSS SPORTS

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Athletes face several infection pathways- sport-associated (skin/wound infections, overtraining-related susceptibility), lifestyle-associated (team housing), travel-associated exposure, and community-level illnesses. Hygiene routines, vaccination status, training load, and shared-equipment practices can influence risk and performance. To estimate recent infection prevalence and patterns among athletes in Tirana and identify modifiable risk and protective factors related to sport type, training load, hygiene practices, travel, and vaccination. Cross-sectional survey of competitive and recreational athletes (≥14 years) from team and individual sports in Tirana. The 8–10 minute questionnaire captures demographics, sport/training profile, recent infections (respiratory, gastrointestinal, skin/soft-tissue), STI awareness/testing, hepatitis/vaccination status, shared-equipment and hygiene practices, travel, and perceived performance impact. Descriptive statistics (prevalence, 95% CI) and logistic regression will explore associations between infection outcomes and exposures (e.g., high training load, shared gear, overnight travel). Ethical consent/assent obtained; responses anonymous. Higher prevalence among athletes in full-contact sports (e.g., wrestling, football) compared with non-contact sports. Poor hygiene practices, such as sharing personal items and irregular gear disinfection, correlate with increased infection rates. Athletes with heavier training loads and frequent team travel report more days missed and greater performance impact. Sports clubs and federations should prioritize preventive education, routine cleaning protocols, and access to medical consultation, ensuring athletes maintain both health and competitive readiness.

O21
A COMPARATIVE STUDY OF MOTOR ABILITIES ACROSS SPORTS AND GENDER IN CHILDREN

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The assessment of motor abilities represents a critical dimension in understanding the physical development and sport-specific adaptation of children and adolescents. This study aimed to compare

motor performance across sports and gender, focusing on flexibility, agility, and speed as fundamental indicators of physical fitness. Data were collected through standardized motor tests, including the Sit-and-Reach (flexibility), the 10x5m shuttle test (agility), and the 10m sprint (speed), administered to youth athletes in volleyball, basketball, and football. Percentile-based normative values were calculated separately for boys and girls, across multiple age groups, to provide an objective comparison of motor abilities. Results demonstrated that boys generally outperformed girls in speed and agility, with consistent advantages across all sports and age categories, highlighting gender-related physiological adaptations. Conversely, girls displayed superior performance in flexibility, confirming previously reported gender trends in musculoskeletal elasticity. Sport-specific comparisons revealed that volleyball athletes achieved higher flexibility scores, whereas football players exhibited greater sprinting capacity. Basketball participants showed balanced outcomes, performing competitively in both agility and sprint domains but at intermediate levels of flexibility. The findings underscore the interplay between gender and sport specialization in shaping motor abilities. From a practical perspective, the generated percentile normatives provide coaches, educators, and sport scientists with reference standards for monitoring youth performance, tailoring training interventions, and identifying talent across disciplines. Furthermore, these results support the integration of gender-sensitive approaches in physical education and sports training programs, ensuring equitable opportunities for performance development.

O22
JOINT HEALTH AND RHEUMATOLOGIC SYMPTOMS AMONG ATHLETES IN TEAM SPORTS IN ALBANIA

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Sports characterized by repetitive high-impact loading and multidirectional movements, such as football, volleyball, and basketball, may increase susceptibility to overuse syndromes, joint inflammation, and soft tissue injuries. Despite this, rheumatology-specific data on athletes remain limited, particularly in small-scale sport-specific samples. The aim of this study was to investigate the prevalence of rheumatology-related symptoms and their functional impact among athletes engaged in football, volleyball, and basketball. A cross-sectional assessment was conducted with 45 competitive athletes (football, volleyball, basketball). Data were collected through a structured questionnaire that included demographic characteristics, sport participation history, and rheumatology-related symptom screening. Outcomes included frequency and severity of joint pain, swelling, stiffness, and fatigue, as well as missed training sessions and functional limitations in sport-specific movements. Overall, mostly of athletes reported episodes of joint pain within the last six months. Football players demonstrated the highest prevalence, followed by volleyball and basketball players. Morning stiffness lasting longer than 30 minutes was reported by 20% of participants, while joint swelling after training or competition was observed. The mean number of training sessions missed due to joint-related symptoms was 3.2 ± 2.1 across the cohort. Functional limitations were most frequently observed in jumping and pivoting movements, followed by running and upper-limb overhead activities such as spiking or shooting. Additionally, mostly of athletes reported fatigue that directly interfered with training intensity. Rheumatology-related symptoms are relatively common among athletes involved in football, volleyball, and basketball. Although most cases were mild, the presence of joint pain, stiffness, and swelling indicates a need for early screening and preventive interventions to minimize long-term musculoskeletal complications. Future longitudinal studies should explore causal relationships and sport-specific risk profiles to better inform clinical practice and athlete health management.

O23
ADOPTION, AWARENESS, TRUST–PRIVACY, AND INTENTION TO USE OF WEARABLE TECHNOLOGIES IN MATERNAL AND INFANT HEALTH: A 2018–2025 REVIEW

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Wearable technologies are becoming more widespread in health care and can provide continuous monitoring in maternal health. The objective of this review is to explore the determinants of adoption, awareness, trust-privacy relationship, and intention-to-use wearable technology in MCH between 2018-2025. A search of literature dated 2018-2025 was performed using PubMed, Scopus, Web of Science, and Google Scholar. Keywords were wearable technology, maternal health, pregnancy, postpartum, adoption, acceptance, trust, intention, and privacy. Eligibility: studies of pregnant/postpartum women using wearables or mobile health devices. Findings were synthesized thematically. The data indicate a high expected acceptance of wearing devices. In one survey, %91 of pregnant women found an ECG wearable acceptable, and %78 felt that they could wear it day and night, while %42 would pay approximately $200. Wearable and app-based interventions have been shown in RCTs to reduce weight gain and boost postpartum activity. But trust and privacy are still major concerns. A 2025 live study on top manufacturers found lack of transparency and user control over privacy statements. Additional challenges are cost, digital literacy, and inequality. Facilitators are recommendations by medical specialists, user-friendliness, and embedment in clinical routines. Wearable devices manifest great potential in maternal and neonatal health. Wider use depends on stronger privacy, clinical integration, and equitable access across diverse groups with long-term results.

O24
OBSERVATION AND ANALYSIS OF EMPLOYEES' HEALTH STATUS THROUGH TELEMEDICINE STATION – A PILOT SURVEY IN LIEBHERR-HAUSGERATE MARICA, PLOVDIV, BULGARIA

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The main objective of the present study is to present how the telemedicine station resources can be used to conduct preventive examinations of employees in the light industry and to assess the main lifestyle risk factors frequency. The survey was conducted in the period June 2025 - August 2025 in Liebherr-Hausgerate Marica Ltd., Plovdiv, Bulgaria. The examinations of 1,198 employees (aged from 20 to 55 years) were done. The following indicators were recorded through the telediagnostics station: height, weight, body mass index, temperature, spirometry, blood sugar, saturation, heart rate, blood pressure and ECG. The data clearly shows that overweight (855, 71.7%) and obesity (407, 34.1%) are leading risk factors that are directly linked to a higher incidence of hypertension, diabetes and lung problems. The data show that 231

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(19.3%) of employees have high blood pressure; 185 (15.4%) - impaired lung function and 153 (12.8%) - high blood sugar levels. The study results underline the need of (1) Prevention and active health programs - weight control through diet and physical activity; (2) Regular screening for hypertension, diabetes and lung problems (3) Cardiological and pulmonological consultations – for employees with identified abnormalities; (4) Promoting healthy lifestyle – training and initiatives to quit smoking, eat healthy and exercise more. Screening programs based on telemedicine technologies provide new perspectives for effective prevention and control in corporative environment.

O25
USING DIGITAL TOOLS IN IMPROVING VOLLEYBALL TECHNIQUE - EXAMPLE OF THE FLOAT SERVE

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Volleyball training technology is constantly evolving, with an increasing reliance on digital assistive devices to support objective motor self-observation. This study aimed to examine the influence of digital tools on learning the float serve. The study involved 18 female volleyball players with a mean age of 13 ± 1 years. The experimental group (n = 9) received video feedback, including recordings of their own serves via mobile phone, footage of elite volleyball players performing serves, and delayed playback (5-second delay) during training sessions. The control group (n = 9) trained without any video feedback. The intervention lasted six weeks. Performance was assessed through initial and final evaluations of float serve execution, and differences between the control and experimental groups were analyzed. Three expert evaluators (professors and doctoral candidates with at least ten years of experience in volleyball) conducted the assessments. Initial evaluation results showed no statistically significant difference between groups. However, the Wilcoxon matched pairs test revealed a statistically significant improvement in the experimental group's final evaluation scores (p = .042). These findings suggest that digital tools can serve as accessible, cost-effective supports for more successful technique acquisition and the prevention of errors in motor learning within sports training.

O26
EFFECTS OF 12 WEEKS OF A TRAINING PROGRAM ON EXERCISE-INDUCED BRONCHOSPASM AND METABOLIC FLEXIBILITY

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We hypothesize that the effects of a 12-week training program may reduce exercise-induced bronchospasm and metabolic inflexibility. Thirty-six overweight adolescents were evaluated. Pulmonary evaluation was performed using an EIB induction test, defined as positive with a decrease in forced expiratory volume in the first second (FEV1) >10%. The percentage of maximum decrease in FEV1 in relation to baseline (% Fall FEV1) and the area above the curve (AAC0-30 FEV1) were calculated. Metabolic phenotyping of body composition, blood pressure (BP), resting heart rate (RHR), and indirect calorimetry (REE) were measured. High-sensitivity C-reactive protein (CRP), blood glucose, and insulin concentrations were collected for analysis. The 12-week training program consisted of various exercise modalities, performed three times a week, totaling 36 sessions. Significant effects of the intervention period were detected for the variables: fat mass (p=0.034), % MG (p=0.033), % fat-free mass (p=0.033), CRP (p<0.001), REE (p=0.018), % Fall FEV1 (p<0.001), and AAC0-30 FEV1 (p<0.001). The training program promoted improvements in exercise-induced bronchospasm and metabolic flexibility. These responses are associated with a reduction in excess weight and an increase in lung function in adolescents with and without EIB.

O27
ANTHROPOMETRIC CHARACTERISTICS AND THEIR RELATIONSHIP WITH PHYSICAL PERFORMANCE IN YOUTH FEMALES FOOTBALL PLAYERS IN TIRANA

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This study aimed to investigate the relationships between anthropometric characteristics and various components of physical performance in youth female football players in Tirana, Albania. Methods for this study included a sample of 36 female football players (mean age = 15.73 ± 2.87 years) underwent anthropometric assessments including body height, body weight, and waist circumference. Physical performance tests included upper-body endurance (30-second push-ups), core endurance (30-second curl-ups), lower-body power (standing long jump, countermovement jump, and vertical jump with run-up), speed (20-meter sprint), and agility (10x5m shuttle run and T-test). Pearson correlation analysis was conducted to explore relationships between anthropometric variables and performance measures. Results showed that no significant correlations were found between anthropometric variables and upper-body or core endurance. In contrast, body height and weight showed significant moderate positive correlations with lower-body power tests (r = 0.387 to 0.503, p < 0.05). Height was also negatively correlated with agility (10x5m test, r = -0.492, p = 0.007), indicating better performance among taller players. No significant correlations were observed between anthropometric variables and speed or T-test performance. In conclusion this cohort of youth female football players, anthropometric characteristics, particularly height and weight, appear to be associated with lower-body power but not with muscular endurance or linear speed. These findings highlight the relevance of body dimensions in power-related performance and may inform talent identification and training approaches in female youth football.

Poster presentations

P1
THE IMPACT OF PHYSICAL EXERCISE ON SMARTPHONE ADDICTION AMONG CHINESE ADOLESCENTS: THE MULTIPLE MEDIATING ROLES OF SELF-ESTEEM AND SELF-CONTROL

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Smartphone addiction has emerged as a significant risk factor threatening adolescents' mental health. While physical exercise is

widely recognized as a promising intervention to mitigate smartphone addiction, the underlying mechanisms remain insufficiently explored. This study employed a questionnaire survey among 821 Chinese adolescents to examine the relationship between physical exercise and smartphone addiction and to explore the multiple mediating effects of self-esteem and self-control. The results revealed that: (1) physical exercise was significantly negatively correlated with smartphone addiction and positively correlated with both self-esteem and self-control; self-esteem and self-control were positively correlated with each other, and both were negatively correlated with smartphone addiction; (2) physical exercise negatively predicted smartphone addiction through multiple mediating pathways, including the independent mediating roles of self-esteem and self-control, as well as their sequential (chain) mediation. These findings shed light on the psychological mechanisms by which physical exercise influences smartphone addiction and provide important theoretical and practical implications for designing effective intervention strategies for adolescent behavioral health.

P2
COMPARATIVE ANALYSIS OF RUNNING QUALITY AND QUANTITY IN FIRST MONTENEGRIN FOOTBALL LEAGUE PLAYERS

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This study aims to analyze and compare the quality and quantity of running in different speed zones between the players of Football Club "Sutjeska" and Football Club "Decic," both competing in the First Montenegrin League, during their head-to-head championship match. The research sample included 13 senior football players from FC "Sutjeska" and 13 from FC "Decic," with goalkeepers from both teams excluded from the analysis. Running performance data were collected using the latest generation Fittogether – Electronic Performance and Tracking System, designed for monitoring and analyzing player activities. The same system was utilized to track and evaluate the performance of players from both teams. Statistical analysis using the t-test for small independent samples revealed no significant differences in either the quality or quantity of running between players of FC "Sutjeska" and FC "Decic" during their match. The lack of statistically significant differences may partially explain the tied final score of the match. Overall, the players from both teams demonstrated highly similar results across all variables measuring the quality and quantity of running in their head-to-head encounter.

P3
THE IMPACT OF LIFESTYLE ON MUSCLE FUNCTION AND BODY COMPOSITION IN HEALTHY OLDER ADULTS

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The aim of this study was to examine the relationship between lifestyle, with a focus on sedentary behavior and physical activity levels, and muscle quality and body composition in healthy older adults. The study emphasized the role of physical activity in maintaining muscle function and optimal body composition during aging. The study included 100 healthy older adults (mean age 55 ± 4.45 years). Sedentary behavior and physical activity levels were assessed using the standardized International Physical Activity Questionnaire (IPAQ). Muscle quality was determined by the ratio of handgrip strength (dynamometer) to skeletal muscle mass, while body composition was measured by bioelectrical impedance analysis (BIA). Statistical analysis included correlation and regression analyses ($p < 0.05$). Longer sedentary time was significantly associated with lower muscle quality ($r = –0.45$; $p < 0.01$) and higher body fat percentage ($r = 0.39$; $p < 0.05$). Participants with higher physical activity levels had significantly greater lean body mass ($p < 0.01$), better muscle quality ($p < 0.01$), and lower body mass index ($p < 0.05$). Multivariate analysis showed that physical activity level was a stronger predictor of muscle quality than age and gender. Reducing sedentary time and increasing physical activity, including aerobic exercise and strength training, positively affect muscle function and body composition, and may be a key strategy for preventing sarcopenia and preserving functional independence in older adults.

P4
DIFFERENCES IN THE QUALITY OF RUNNING AMONG DEFENSIVE, MIDFIELD, AND ATTACK PLAYERS IN ONE OF THE TOP CLUBS IN THE MONTENEGRIN FIRST LEAGUE

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The aim of this research was to determine and compare the quality of running, across 5 different intensity zones, among defensive, midfield, and attacking senior players of Football Club "Sutjeska" during a Montenegrin First League match played on 8 March 2023 against Football Club "Decic". The research sample included 4 defenders, 3 midfielders, and 3 forwards from FC "Sutjeska", who played in a 4-3-3 formation. Goalkeeper was excluded from the analysis. Data on the quality of running were collected using the latest-generation electronic device, Fittogether – Electronic Performance and Tracking System, which records and analyzes player activities during matches. ANOVA revealed statistically significant differences in the quality of running in zones 2, 3, and 5 between the three team lines. The post hoc test indicated that midfielders had a significantly better running quality in zone 2 than defenders and forwards. In zone 3, defenders had significantly lower running quality than midfielders and forwards, while in zone 5, forwards demonstrated significantly better performance than both midfielders and defenders. These findings align with previous research, suggesting that as running intensity increases, forwards achieve better results due to their frequent involvement in high-intensity actions. At slightly lower intensities, midfielders tend to outperform other positions.

P5
COMPARISON OF SHORT DISTANCE SPRINT PERFORMANCE BETWEEN FOUR- AND FIVE-YEAR-OLD CHILDREN

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The purpose of this study is to evaluate the short-distance-running speed differences in children aged four and five. Total sample was consisted of 279 children, and they were divided into four subgroups: boys aged four (n=90), girls aged four (n=66), boys aged five (n=79), and girls aged five (n=59). A photocell timing gates were used to assess the running times over 5 and 10 meters. Timing began when the back foot was raised off the photocell field, and

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all participants began from a standing start position. Student's independent samples t-test was used to differentiate results between subgroups. No statistically significant differences between boys and girls of the same age group in both sprint distances were found. In contrast, statistically significant differences were evident, while comparing age groups within the same gender. Results reveal that five-year-old boys were significantly faster than younger boys in 5m sprint by an average of 0.09sec (t=2.30, p=0.02) and in 10m sprint by an average of 0.18sec (t=2.48, p=0.01). The differences were even more notable in girls, whereas five-year-olds were faster than four-year-olds by an average of 0.12sec in 5m sprint (t=2.84, p=0.01) and by an average of 0.23sec in 10m sprint (t=2.76, p=0.01). To conclude, findings suggest that chronological age does have an important role in sprint performance over short distances, but gender does not have a significant role in four- and five-year-old children.

P6
EFFECTS OF ACTIVE AND PASSIVE RELAXATION ON POST-EXERCISE FATIGUE RECOVERY IN MIDDLE- TO HIGH-INTENSITY RUNNERS

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This study examined the effects of active and passive relaxation strategies on post-exercise recovery of the musculoskeletal system, with the goal of providing evidence for individualized recovery programs in middle- to high-intensity runners. Thirty-seven participants aged 18–35 years, with at least one year of middle- or long-distance running experience and free from chronic cardiovascular or cerebrovascular diseases, were assigned to an active relaxation group (Group A, n=18) or a passive relaxation group (Group B, n=19). Fatigue was induced through three weekly sessions of 40 minutes of running at 75–85% of maximum heart rate (Borg RPE 13–14). Group A performed post-exercise active static stretching, while Group B performed therapist-assisted passive proprioceptive neuromuscular facilitation (PNF) stretching. Passive PNF stretching produced significant improvements in hip and knee extension range of motion, likely due to neural inhibition and connective tissue adaptation. Group B showed large effect size improvements in knee extension and hip extension mobility. Active static stretching showed a trend toward enhancing hip flexion mobility, possibly due to increased proprioceptive input and motor unit recruitment during self-maintained postures. Passive PNF stretching is more effective for rapid restoration of hip and knee extension mobility and is recommended within 24 hours after high-intensity exercise. Active static stretching may support hip flexion mobility and can be used for daily flexibility maintenance. A combined approach is suggested for routine training, with passive stretching prioritized for individuals with lower baseline flexibility.

P7
DIFFERENCES IN MORPHOLOGICAL CHARACTERISTICS OF THE MEMBERS OF MONTENEGRO ARMED FORCES

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The objective of this research is to determine the status and define eventual differences in morphological characteristics of the members of Montenegro Armed Forces constituent parts. The tested sample consisted of 240 soldiers divided into three sub-samples, 80 examinees each, with the following average age: Navy – 38.1±6 ; Air Forces – 38.0±5; Ground Forces – 36.1±7. The sample of measures consisted of four indicators each for the assessment of longitudinal dimensionality, transverse dimension, body mass and volume, subcutaneous fat and body composition. The central parameters variables have been calculated, and for determining possible differences between the subsamples of examinees, the Multivariate analysis of variance (MANOVA), univariate analysis of variance (ANOVA) and post hoc test with Tukey's model to determine differences have been applied. The existence of differences has been found in the morphological space of examinees of the defined subsamples, as well as the fact that seven tested variables contribute to this difference (body height, shoulder width, waist circumference, abdominal skinfold, thoracic skinfold, percentage of body fat and waist to hip ratio). It was concluded that the mentioned differences are probably the consequence of various factors impact that could be related to the origins of soldiers from different ethnographic areas, as well as to the way of performing specific multipurpose military tasks in the constituent parts of army.

P8
DISTRIBUTION OF BODY HEIGHT AND WEIGHT IN BOYS AND GIRLS AGED 4 AND 5 YEARS – SEASON 2024/25

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This study aimed to establish reference values of body height and weight in boys and girls aged 4 and 5 years, as a basis for monitoring growth, identifying deviations, and planning preventive measures. A cross-sectional study was conducted in the 2024/25 season on 318 children (90 boys and 66 girls' aged 4 years, and 79 boys and 83 girls aged 5 years). Measurements were performed under the same conditions at the Children's Fitness Center "Smart Gym," using standardized anthropometric procedures. Data were processed using descriptive statistics. Boys at age 4 averaged 111.3 cm in height and 20.4 kg in weight, while at age 5 these values increased to 115.0 cm and 21.6 kg. Girls averaged 110.9 cm and 20.1 kg at age 4, and 114.2 cm and 21.4 kg at age 5. These results confirm expected developmental patterns and indicate continuous growth across the two observed age groups. The findings show that the obtained data reflect stable growth trends and specific characteristics of Montenegrin children. The results provide a step toward establishing national reference values, useful to health professionals, educators, and sports experts for assessing and monitoring physical development, as well as planning preventive measures.

P9
ESPORTS PHYSICAL EXERCISE/PERFORMANCE MATRIX 1.0 COUNTRY FACTSHEETS: NATIONAL REPORTS FROM WESTERN BALKAN COUNTRIES

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This research presents the first regionally coordinated analyses of physical exercise and performance indicators among esports players across five Western Balkan countries: Albania, Bosnia and Her-

zegovina, Kosovo, Montenegro, and North Macedonia. Using the Esports Physical Exercise/Performance Matrix 1.0 framework, the study assessed nine core indicators related to public health issues within the esports ecosystem. Drawing on peer-reviewed literature, national datasets, and secondary sources, the analysis revealed a systemic absence of reliable data and institutional engagement, with all countries receiving zero scores across every indicator. These findings echo previous results from Serbia and highlight a critical regional failure to integrate health promotion within the esports domain, despite relevant digital infrastructure and growing esports participation. The study calls for urgent, cross-sectoral action to bridge the gap between digital advancement and physical health oversight in esports. The provided factsheets offer a foundational reference for future policy development, research, and community-based interventions aimed at fostering a healthier, more sustainable esports environment in the Western Balkan countries.

P10
ASSESSING ACTIVE TRANSPORTATION IN AGING-FRIENDLY COMMUNITIES: A PROTOCOL FOR OLDER ADULTS IN PODGORICA

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Active transportation is a key determinant of healthy aging, linking mobility, physical activity, and environmental design. This study presents a protocol developed to assess the experiences of older adults in Podgorica with a focus on walking, cycling, and public transport use. While the questionnaire covers housing, health services, social inclusion, and safety, the active transportation module is designed to capture behavioral patterns, motivations, and barriers. Participants report on the frequency and duration of physical activity, perceived benefits such as health improvement or cost savings, and obstacles including unsafe sidewalks, traffic risks, poor weather, or inadequate resting areas. Additional items explore perceptions of safety when walking or cycling during day and night. The survey will target residents aged 65 and above through a cross-sectional design, using stratified sampling to represent diverse neighborhoods. Data analysis will combine descriptive statistics with multivariate modeling to identify associations between socio-demographic factors, health status, and mobility barriers. By integrating environmental, behavioral, and perceptual measures, the protocol offers a comprehensive approach to evaluating age-friendly transportation systems. The results will inform evidence-based strategies to improve urban mobility, safety, and inclusiveness for older adults. Moreover, the tool provides a replicable framework for comparative studies of active transportation in aging populations across different urban contexts.

P11
EFFECTS OF THE FLIPPED CLASSROOM MODEL ON STUDENTS' ATTITUDES TOWARDS PHYSICAL EDUCATION

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This study aimed to evaluate whether the flipped classroom model could foster more positive attitudes towards physical education among elementary school students compared to traditional teaching methods. The sample included 54 sixth-grade students (27 experimental, 27 control; mean age 11±0.5 years). The experimental group received physical education through the flipped classroom model supported by mobile technologies, while the control group followed traditional instruction. Attitudes were measured before and after an eight-week intervention using the standardized PE Attitude Scale, which covers satisfaction, comfort, perceived activity, and perception of the teacher. Statistical analyses (independent t-tests and ANOVA with repeated measures) were applied to assess intergroup and intragroup differences. Prior to the intervention, both groups expressed moderately positive attitudes with no significant differences ($p > 0.05$). After the intervention, students in the experimental group demonstrated statistically significantly higher mean values across all four attitude dimensions compared to the control group ($p < 0.05$). The most notable improvements were observed in satisfaction with classes and perception of activity. The findings confirm the hypothesis that the flipped classroom model positively influences students' attitudes towards physical education. By creating engaging and technology-enhanced learning experiences, this model contributes to improved motivation and perception of physical education, highlighting its potential for broader application in school curricula.

P12
ANALYSIS OF SCHOOLBAG WEIGHT IN STUDENTS AGED 10–12 YEARS IN RELATION TO WORLD HEALTH ORGANIZATION GUIDELINES

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Previous research shows that excessive schoolbag weight is linked to postural problems and musculoskeletal health issues in children. This study examined whether schoolbag weight in students aged 10–12 years complies with World Health Organization (WHO) recommendations. The purpose of this study is to determine whether schoolbag weight exceeds the recommended 10–15% of body weight and to test for differences between boys and girls. The study involved 126 students (66 boys and 60 girls). Body weight and schoolbag weight were measured, and relative load was calculated as a percentage of body weight. Data were analyzed using descriptive statistics and an independent samples t-test, with significance set at $p < 0.05$. The mean schoolbag weight for the overall sample was within the WHO-recommended 10–15% of body weight. However, about 25% of students carried schoolbags exceeding the maximum 15%. The t-test showed no statistically significant differences between boys and girls ($p > 0.05$), although a higher proportion of girls were individually overloaded compared to boys. A substantial number of students carry schoolbags heavier than WHO recommendations, which may negatively affect children's health. Preventive and educational measures are needed to reduce schoolbag loads, particularly in the preadolescent period when growth is rapid, and vulnerability to musculoskeletal deformities is high.

P13
ANALYSIS OF THE RELATIONSHIP BETWEEN BODY HEIGHT AND WAIST CIRCUMFERENCE IN MALE ADOLESCENTS IN MONTENEGRO

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The aim of the work is to determine the level of obesity based on the ratio of body height and waist circumference in male adolescents in Montenegro. The research was conducted on a sample of

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575 male respondents, of which 121 respondents were from the Northern region, 330 respondents were from the Central region and 124 respondents were from the Southern region. According to the obtained results of the ratio of body height and waist circumference, the highest percentage of obesity in adolescents from the Northern region is 19.3%, while in the Southern region this percentage is much lower and is 11.4%. When it comes to adolescents from the Central region, the percentage of obesity is 14.9%. The conclusion is that in Montenegro, when it comes to the age of male adolescents, the percentage of obesity still does not represent a global problem as in other countries that face the epidemiological scale of obesity.

P14
THE INFLUENCE OF MOTOR SKILLS ON PERFORMANCE IN SITUATIONAL TESTS OF YOUNG FEMALE HANDBALL PLAYERS

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The aim of this study was to examine the relationship between motor abilities and situational performance in youth handball, as well as the predictive value of motor abilities for technical execution. The sample consisted of 30 female handball players, aged 13 and 15 years, all members of HC "Zeta." Participants were required to be clinically healthy and engaged in handball training for at least one year. Motor abilities were assessed according to the standardized EUFITMOS fitness testing protocol. For situational performance, five handball-specific situational tests were applied, defined based on established criteria to successfully replicate real game activities. The motor test battery included the pacer test, push-ups, standing long jump, 20-meter sprint, and single-leg sit-and-reach. The situational battery consisted of side steps, start speed with the ball over 20 meters, juggling with two balls, ball throwing for distance from a jump, and shot accuracy from 7 meters. Regression analysis showed statistically significant predictive influence of motor abilities on three situational variables: side steps ($R = .595$, $p = .050$), start speed with the ball ($R = .609$, $p = .038$), and throwing the ball for distance ($R = .782$, $p = .000$). No significant influence was found for juggling with two balls or shot accuracy from 7 meters. Findings partially confirmed the hypotheses, highlighting that explosive power, speed, and coordination strongly determine situational efficiency in youth handball. Results underline the importance of early motor development in optimizing technical performance and improving long-term player selection and training processes.

P15
EFFECTS OF EXERCISE PROGRAMS ON POSTURAL STABILITY

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Regular physical activity is a key factor in maintaining health, improve motor abilities, and optimise body composition. However, it is unknown to what extent the results of combined exercise programs differ from those of single-exercise programs. This study aimed to investigate changes in postural stability, jumping performance, and anthropometric parameters following two different training regimens. Forty women aged 27–57 years were divided into two groups: E1 (n=22), who performed a combined exercise program three times per week for 12 weeks, and E2 (n=18), who engaged in a single exercise program during the same period. Pre- and post-intervention assessments included postural stability oscillations while standing on the left and right leg with eyes open, jumping performance indicators (average jump height, maximum power, contact time), body mass index (BMI), body fat percentage, and muscle mass. Data were analysed using two-way ANOVA (Group×Time) with η^2/ω^2 and Bonferroni correction ($\alpha=0.05$). Significant time and interaction effects were observed for postural stability. For the left leg, a moderate time effect ($F(1,38)=8.72$, $p=0.005$, $\eta^2=0.085$) and significant interaction ($F(1,38)=9.28$, $p=0.004$, $\eta^2=0.091$) were found, with group E1 showing greater improvement. For the right leg, a strong time effect ($F(1,38)=26.21$, $p<0.001$, $\eta^2=0.170$) and large interaction ($F(1,38)=26.18$, $p<0.001$, $\eta^2=0.169$) were confirmed, again favouring group E1. Jumping performance indicators did not change significantly. Significant time effects were found for BMI and body fat percentage, with reductions in both groups, while E1 group maintained higher muscle mass values across time. The combined program demonstrated superior effects on postural stability compared to the single program, highlighting its greater potential to enhance motor performance, reduce injury risk, and support functional capacity.

P16
PARAVAULTING WORLDWIDE

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Paravaulting is an emerging para-equestrian discipline that combines gymnastics and vaulting on horseback for athletes with disabilities. Originating in the Czech Republic, it has grown into a meaningful form of inclusive sport that promotes physical development, social integration, and intercultural dialogue. Yet, discipline lacks internationally recognized rules, standardized training methods, and a unified competition system. The purpose of this study is to present the Paravaulting Worldwide (PAWO) project, which aims to establish foundations for international methodology and future sport regulations. The project is implemented under Erasmus+ and coordinated by the Czech Equestrian Federation in partnership with organizations from Turkey, Poland, Slovakia, and Portugal. Its methods include webinars, practical workshops; and a pilot paravaulting camp with athletes with disabilities. These activities combine knowledge transfer, professional training, and intercultural exchange to create a shared methodology. The initiative has produced a growing network of trainers and therapists equipped with enhanced competences in paravaulting. It has also initiated the drafting of unified methodological guidelines and created opportunities to test training and competition formats across equestrian traditions. The collaborative process has raised awareness of paravaulting as both a therapeutic and competitive sport, highlighting its potential for broader recognition. Paravaulting offers unique opportunities for inclusion in sport, yet its international development depends on the creation of harmonized rules and standards. The PAWO project demonstrates how

transnational cooperation can build professional capacity, inspire innovation, and lay the groundwork for recognition of paravaulting as an official para-equestrian discipline abroad.

P17
THE EFFECTS OF A TRAINING PROGRAM ON THE SPEED-ACCURACY TRADE-OFF OF IN INSTEP KICK OF YOUNG SOCCER PLAYERS

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The aim of this research is to test the speed of kicking the ball and actual accuracy, depending on applied training model. This experiment completed evaluation of the effects of a training program for developing the kicking speed (experimental group for the speed) and the training program for developing the kicking accuracy (experimental group for the accuracy) onto variables for evaluation of speed and accuracy of a kicked ball. The research involved 26 male young football players, of the average 15 years of age (+/- 0.8), the average height of 168 cm (+/- 7.7) and the average weight of 55.1 kg (+/- 7.5). The actual accuracy is estimated based on the mean radial error (SRE), the mean centroid error (CRG) and the bivariate variable error (BVG) which represent measured spatial errors within a two-dimensional coordinate system, as well as based on errors which follow kicking deviations in one-dimension, i.e. by horizontal (X) and vertical (Y) axis. Speed of a kick was analysed based on relative (Vrel) and absolute (V) values. The results of the three-way ANOVA show a significant effect of the test factor and the instruction factor on the speed variable, as well as a significant interaction effect between these two factors. Additionally, a simple effect analysis of the test factors was conducted, and the results showed that the difference between the initial and final measurement existed only when performing strikes with the accuracy instruction. According to the key findings, training programs for speed development were developed separately, i.e. training programs for development of accuracy did not result in expected specific impact onto experimental groups; however, generally speaking, for all experimental groups variable values of the speed and accuracy of performance were changed in the final measurement compared to the initial one. In other words, respondents included in the final measurement generated kicks of less error irrespective of the training program that was carried out, and it can be said that the general training of instep kicks impacted improvement of accuracy of respondents. Furthermore, this increase in accuracy goes along with reduction of speed of the ball flight.

P18
BUILDING INCLUSIVE SPORTS COMMUNITIES: RESULTS FROM THE SELECTION OF SAM METHODOLOGIES IN MONTENEGRO

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The purpose of this study was to identify the most relevant Sport Academy Methodology (SAM) modules for implementation in Montenegro, supporting inclusive, sustainable, and community-oriented approaches to sports education. To achieve this, a structured survey was conducted among 12 organizations, including schools, sports clubs, NGOs, and national federations, all of which collectively serve diverse participant groups ranging from children to adults. Respondents evaluated 14 SAM modules against ten key criteria, such as relevance to the local context, feasibility, impact on vulnerable groups, cost-effectiveness, and pedagogical innovation, using a five-point Likert scale. The results revealed three top-ranked methodologies: Summer Day Camp (mean score 4.81/5), Family Training (4.73/5), and Sporty Birthday – Fun, Movement, Friendship (4.73/5). These modules were consistently valued for their inclusiveness, adaptability, and potential to strengthen both physical and social development. Specifically, Summer Day Camp was highlighted for its capacity to engage broad age groups, Family Training for its strong intergenerational and special-needs inclusion, and Sporty Birthday for its creative and motivational appeal. Collectively, the findings indicate that the selected modules address complementary settings, formal education, family-based training, and informal social contexts, ensuring broad community impact. In conclusion, adopting these three methodologies provides a practical, innovative, and socially impactful framework for fostering lifelong engagement in sport. Pilot implementation, trainer capacity-building, and systematic evaluation are recommended to maximize sustainability and embed SAM values within local communities.

P19
LOCAL PROMOTION OF PHYSICAL ACTIVITY IN MONTENEGRO: CHALLENGES AND PERSPECTIVES

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Physical activity is a cornerstone of public health promotion, yet in Montenegro there is still a lack of systematic data on local initiatives and their impact. The aim of this study is to provide an overview of existing policies and programs for local promotion of physical activity, and identify challenges and perspectives for further development within the Montenegrin context. A scoping review approach was applied, following PRISMA-ScR guidelines. Relevant scientific papers, reports from international organizations (WHO, EU), and grey literature such as national strategies, local initiatives, and reports from sports associations were analyzed. Special attention was given to the period 2020–2024. Findings indicate that there are numerous initiatives implemented in schools, communities, and through national campaigns, such as European Week of Sport. However, systematic monitoring of their outcomes remains limited. The main barriers are insufficient infrastructure, low engagement of local authorities in long-term programs, and a lack of evaluation mechanisms. Areas with particularly scarce data include active transport and digital interventions. Local promotion of physical activity in Montenegro benefits from a visible institutional framework, but faces significant gaps in implementation and evaluation. Further research is needed, especially regarding the effects of initiatives on different target groups and the integration of digital technologies. This review may serve as a foundation for developing more effective, sustainable, and locally tailored programs to promote physical activity.

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P20

INCLUSIVE AND SUSTAINABLE ACTIVE MOBILITY: CONTEXT-SENSITIVE RECOMMENDATIONS FOR OLDER ADULTS IN MONTENEGRO

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This study aims to develop evidence-based, context-sensitive recommendations for promoting inclusive and sustainable active mobility among older adults in Montenegro. It is part of a Short-Term Scientific Mission supported by the COST Action CA23101 – BOPALiM. This research will include five phases: (1) review of local mobility policies and literature on age-friendly urban design; (2) systematic field observations in Podgorica using checklists and photo documentation; (3) GIS-based mapping of existing mobility infrastructure; (4) formulation of recommendations based on field findings and WHO's active ageing policy framework; and (5) reporting and dissemination. Local stakeholder consultations and secondary data analysis will support all phases. The expected findings include a visual GIS map of active mobility infrastructure, identification of infrastructure gaps affecting older adults, and practical policy and design recommendations. These outcomes will contribute to BOPALiM Working Groups 1–4 by offering theoretical insight, practical guidance, stakeholder engagement materials, and dissemination tools for inclusive mobility planning. By integrating field-based research with policy-oriented outputs, these findings will provide actionable insights into age-friendly mobility challenges in Southeast Europe. It is expected to support the broader BOPALiM mission by fostering interdisciplinary collaboration and offering scalable models for inclusive, lifelong community mobility. This research has been done in line with the BOPALIM COST Action's objectives (CA23101).

Workshops presentations

W1

SCIENCE IS NOT SCARY: CHILDREN AS YOUNG RESEARCHERS AT THE PASTECHL PODGORICA 2025 CONFERENCE

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This is an interactive workshop for primary school students within the international scientific conference. As part of the PASTECHL Podgorica 2025 conference, a special workshop entitled "Science is Not Scary" is organized for primary school students aged 11 to 14. The workshop aims to engage children in the research process and present science in a creative, accessible, and inspiring way. Through mentorship and the presentation of their own projects, students have the opportunity to step into the role of researchers and active participants of a scientific conference for the very first time. The main goal of the workshop is to promote science among primary school children through an interactive scientific session, to foster curiosity, critical thinking, and research skills, and to connect educational institutions and scientists in joint knowledge creation. Five specific goals are being conducted: engaging students from three Montenegrin primary schools (Budva, Podgorica, Danilovgrad) in a mentorship process and preparation of research projects; developing students' basic research skills, teamwork abilities, and public speaking confidence; organizing a simulation of a real scientific session at the Science and Technology Park of Montenegro, enabling discussion between students and experts; increasing the visibility of science in society through live streaming and media promotion; and encouraging schools and the scientific community to more actively involve children in research-oriented projects. Within these activities, students present their own research projects on topics related to sports sciences (e.g., measuring pulse, biomechanical analyses, and effects of exercise), the audience includes peers, teachers, and conference participants – researchers and scientists, and after the presentations an interactive discussion follows where children and experts jointly form conclusions and learn how scientific argumentation works. The workshop is open to parents and the general public, further amplified by online streaming and potential cable TV coverage. It is designed as an innovative way of promoting science among young people, allowing students not only to gain public presentation experience but also to build confidence, curiosity, and critical thinking. The project connects schools, scientists, and institutions, creating a platform that may serve as a model for future science promotion activities throughout Montenegro. The workshop is co-funded by the Ministry of Education, Science and Innovation of Montenegro, through the Public Call for Co-Financing Scientific Research Activities in 2025, within the category "Promotion of Science and Research Activities".

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May 2022

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IT-SPA honors a six-weeks for an initial decision of manuscript submission. Authors should submit the manuscripts as one Microsoft Word (.doc) file.
Manuscripts must be provided either in standard UK or US English. English standard should be consistent throughout the manuscripts.

Format the manuscript in A4 paper size; margins are 1 inch or 2.5 cm all around. Type the whole manuscript double-spaced, justified alignment.

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

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

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

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

1.2. Type & Length

IT-SPA publishes following types of papers

Original scientific papers are the results of empirically- or theoretically-based scientific research, which employ scientific methods, and which report experimental or observational aspects of sports science and medicine, such as all clinical aspects of exercise, health, and sport; exercise physiology and biophysical investigation of sports performance; sport biomechanics; sports nutrition; rehabilitation, physiotherapy; sports psychology; sport pedagogy, sport history, sport philosophy, sport sociology, sport management; and all aspects of scientific support of the sports coaches from the natural, social and humanistic side. Descriptive analyses or data inferences should include rigorous methodological structure as well as sound theory. Your manuscript should include the following sections: Introduction, Methods, Results, and Discussion.

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Original scientific papers should be:

- Up to 3000 words (excluding title, abstract, tables/figures, figure legends, Acknowledgements, Conflict of Interest, and References);
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Review papers should provide concise in-depth reviews of both established and new areas, based on a critical examination of the literature, analyzing the various approaches to a specific topic in all aspects of sports science and medicine, such as all clinical aspects of exercise, health, and sport; exercise physiology and biophysical investigation of sports performance; sport biomechanics; sports nutrition; rehabilitation, physiotherapy; sports psychology; sport pedagogy, sport history, sport philosophy, sport sociology, sport management; and all aspects of scientific support of the sports coaches from the natural, social and humanistic side.

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

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- Maximum combined total of 6 Tables/Figures.

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Transfer of Learning on a Spatial Memory Task between the Blind and Sighted People Spatial Memory among Blind and Sighted

Original Scientific Paper

Transfer of learning on a spatial memory task

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Word count: 2,980

Abstract word count: 236

Number of Tables: 3

Number of Figures: 3

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Affiliation consists of the name of an institution, department, city, country/territory(in this order) to which the author(s) belong and to which the presented / submitted work should be attributed. List all affiliations (each in a separate line) in the order corresponding

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

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In case all authors belong to the same institution affiliation numbering is not needed. Whenever possible expand your authors' affiliations with departments, or some other, specific and lower levels of organization.

2.1.6. Corresponding author

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

2.1.7. Manuscript information

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

2.2. Abstract

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

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

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

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

Abstract

Results of the analysis of…
Key words: spatial memory, blind, transfer of learning, feedback

2.3. Main Chapters

Starting from the third page of the manuscripts, it should be the main chapters. Depending on the type of publication main manuscript chapters may vary. The general outline is: Introduction, Methods, Results, Discussion, Acknowledgements (optional), Conflict of Interest (optional), and Title and Abstract in Montenegrin (only for the authors from former Yugoslavia, excluding Macedonians and Slovenes). However, this scheme may not be suitable for reviews or publications from some areas and authors should then adjust their chapters accordingly but use the general outline as much as possible.

2.3.1. Headings

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

- ✓ **Methods**

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

- ✓ *Table position of the research football team*

2.3.2 Ethics

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

2.3.3 Statistics reporting

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

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

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

2.4. References

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

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

2.4.1. References style

IT-SPA adheres to the American Psychological Association 7th Edition reference style. Check the Publication Manual of the American Psychological Association (2019), Seventh Edition that is the official source for APA Style, to ensure the manuscripts conform to this reference style. Authors using EndNote® to organize the references must convert the citations and bibliography to plain text before submission.

2.4.2. Examples for Reference citations

One work by one author

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

Works by two authors

- ✓ Duffield and Marino (2007) studied…
- ✓ In one study (Duffield & Marino, 2007), soccer players…
- ✓ In 2007, Duffield and Marino's study of soccer players…

Works by three or more authors: cite only the name of the first author followed by et al. and the year

- ✓ Bangsbo et al. (2008) stated that…
- ✓ In one study (Bangsbo et al., 2008), soccer players…

Works by organization as an author: cite the source, just as you would an individual person

- ✓ According to the American Psychological Association (2000)…
- ✓ In the APA Manual (American Psychological Association, 2003), it is explained…

Two or more works in the same parenthetical citation: citation of two or more works in the same parentheses should be listed in the order they appear in the reference list (i.e., alphabetically); separated by a semi-colon

- ✓ Several studies (Bangsbo et al., 2008; Duffield & Marino, 2007; Reilly, 1997) suggest that…

2.4.3. Examples for Reference list

Works by one author
Borg, G. (1998). *Borg's perceived exertion and pain scales*: Human Kinetics.

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

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

Works by more than twenty authors
Krustrup, P., Mohr, M., Amstrup, T., Rysgaard, T., Johansen, J., Steensberg, A.,… Bangsbo, J. (2003). The yo-yo intermittent recovery test: physiological response, reliability, and validity. *Medicine & Science in Sports & Exercise, 35*(4), 697–705. https://doi.org/10.1249/01.mss.0000058441.94520.32

Works by group of authors
NCD-RisC. (2017). Worldwide trends in body-mass index, underweight, overweight, and obesity from 1975 to 2016: a pooled analysis of 2416 population-based measurement studies in 128.9 million children, adolescents, and adults. *Lancet*, 390(10113), 2627-2642. https://doi.org/10.1016/s0140-6736(17)32129-3

Works by unknown authors
Merriam-Webster's collegiate dictionary (11th ed.). (2003). Merriam-Webster.

Journal article (print)
Scruton, R. (1996). The eclipse of listening. *The New Criterion, 15*(3), 5–13.

Journal article (electronic)
Aarnivala, H., Pokka, T., Soininen, R., Mottonen, M., Harila-Saari, A., & Niinimaki, R. (2020). Trends in age- and sex-adjusted body mass index and the prevalence of malnutrition in children with cancer over 42 months after diagnosis: a single-center cohort study. *European Journal of Pediatrics,* 179(1), 91-98. https://doi.org/10.1007/s00431-019-03482-w

Thesis and dissertation
Pyun, D. Y. (2006). *The proposed model of attitude toward advertising through sport*. [Unpublished Doctoral Dissertation]. The Florida State University.

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

Chapter of a book
Armstrong, D. (2019). Malory and character. In M. G. Leitch & C. J. Rushton (Eds.), *A new companion to Malory* (pp. 144-163). D. S. Brewer.

Reference to a Facebook profile
Little River Canyon National Preserve (n.d.). *Home* [Facebook page]. Facebook. Retrieved January 12, 2020 from https://www.facebook.com/lirinps/

2.5. Tables

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

Tables should be presented as standard MS Word tables.

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

Tables and table headings should be completely intelligible without reference to the text. Give each column a short or abbreviated

heading. Authors should place explanatory matter in footnotes, not in the heading. All abbreviations appearing in a table and not considered standard must be explained in a footnote of that table. Avoid any shading or coloring in your tables and be sure that each table is cited in the text.

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

2.5.1. Table heading

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

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

2.5.2. Table sub-heading

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

2.5.3. Table footnotes

Table footnotes should be written below the table.

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

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

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

- ✓ [a]One participant was diagnosed with heat illness and n = 19.[b]n =20.

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

- ✓ *P<0.05,†p<0.01.

2.5.4. Table citation

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

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

2.6. Figures

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

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

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Figures and figure legends should be completely intelligible without reference to the text. The price of printing in color is 50 EUR per page as printed in an issue of IT-SPA.

2.6.1. Figure legends

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

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

2.6.2. Figure citation

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

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

2.6.3. Sub-figures

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

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

2.7. Scientific Terminology

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

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

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

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

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

2.8. Latin Names

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

- ✓ First time appearing: *musculus biceps brachii*
- ✓ Abbreviated: *m. biceps brachii*

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