19th FIEPS European Congress

"Inspiring Excellence:
Empowering the Future of Physical and Sport Education"

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BOOK OF ABSTRACTS

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ASDER TİKA igenas

Message from the Congress President

It is with great pride and heartfelt gratitude that I address you through this abstract book, marking the successful completion of the 19th FIEPS European Congress, held under the inspiring theme: “Inspiring Excellence: Empowering the Future of Physical and Sport Education.”

Hosted in the vibrant and historically rich city of Antalya, Turkey, this congress brought together over 300 participants and featured nearly 250 scientific contributions, creating a dynamic and interdisciplinary platform for the exchange of knowledge, ideas, and practices. With delegates from 42 countries, the congress served as a true celebration of international collaboration and academic excellence in the fields of physical education, sport sciences, health, and movement culture.

As the Congress President, I am deeply honored to have witnessed the passion, innovation, and commitment reflected in every session, presentation, and discussion. This gathering was not only a testament to the strength of our academic community, but also a call to action for shaping the future through inclusive, quality, and forward-thinking physical and sport education.

I extend my sincere appreciation to all authors, speakers, moderators, participants, and institutional supporters who contributed to making this event a memorable success. I would also like to thank the organizing committee, volunteers, and technical teams whose tireless efforts were invaluable in every step of the process.

I hope this abstract book serves not only as a record of the valuable academic work shared during the congress but also as a source of inspiration for future research, policy development, and educational transformation.

With best wishes for continued success in your scholarly and professional endeavors,
Warm regards,

Prof. Dr. Neşe Şahin
President of the 19th FIEPS European Congress

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Date: April 24, 16:45-18:00

Symposium Topic: The FitBack Toolkit: Missing Piece between Fitness Monitoring and Physical Literacy

Symposium Presentations:

1. The Scientific Background of FitBack Platform

2. From Assessment to Empowerment: The FitBack Toolkit's Role in Enhancing Physical Literacy

3. Application of the FitBack Toolkit for Improving the Physical Literacy of Students in Physical Education Classes – Serbian Teachers' experiences

4. Monitoring physical fitness to enhance the development of physical literacy in children and adolescents - Estonian example

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MAIN ORGANIZATIONS

TABLE OF CONTENTS
Oral Presentation

No	Title	Page
1	Efficacy of creatine supplementation with carbohydrate restriction on long jump performance	1
2	Accelerometer-measured physical activity on 5th grade students during school hours	2
3	Modern learning process: teaching gymnastics with the application of kinematic modelling	3
4	Physical literacy development in Lithuania: trends and challenges in pre-school education	4
5	Physiological intensity of physical workouts taking into account the individual profile and model characteristics of physical fitness in belt wrestling classes	5
6	The impact of sedentary behavior and organized physical activities on the development of fundamental motor skills in eight-year-old children: Application of the TGMD-2 test	6
7	Game intelligence in sport. An exploratory sequential mixed methods design for rugby	7
8	The challenges and strategies for school physical education curriculum and instruction under low fertility rates in Taiwan	8
9	Creative problem solving teaching strategy in sport instructi : Creativity is unstoppable	9
10	Physical activity barriers perceived as a predictor of the level of nomophobia in the students of the faculty of sports sciences	10
11	Exploring the link between parent-child physical activity, parental beliefs and childhood obesity in Taiwanese preschoolers	11
12	The relationship between physical activity levels and fear of falling in older adults	12
13	Sufism, the enneagram and fair play in sports: Exploring moral norms and spiritual forms of sportsmanship	13
14	Physical activity and body composition of primary school students in three southeastern european countries	14
15	Design of an inventory for the evaluation of attitudes and teaching practices on sustainable development in physical education	15
16	The relationship between motor fitness test complexity and executive functions in preadolescents	16
17	Effects of six-week of high intensity resistance-based aerobic exercise on computerized dynamic posturography, functional head impulse test, and body composition scores in adult sedentary women	17
18	Assessing concurrent validity and reliability of burnout measurement tools in basketball referees	18
19	The effect of recreational therapy-based yoga practice on depression, leisure satisfaction and heart rate variation in individuals age 65 and over	19
20	Comparision of the effects of aerobic and resistance exercises on cardiovascular biomarkers on sedentary women	20

TABLE OF CONTENTS
Oral Presentation

No	Title	Page
21	Acute effect of Yo-Yo intermittent recovery test (Level-1) performed at different times of the day on inflammation parameters	21
22	Beyond playgrounds: Equipping educators and coaches as agents of physical activity through EduPASS modular upskilling	22
23	Examining the effect of professional bodybuilders' social media use on body satisfaction and narcissism levels	23
24	Sex differences in students' motivation for running	24
25	Effects of neuromuscular exercise strategies on injury risk profile	25
26	Comparing the acquisition of fundamental movement skills in half-day schooling and extended school program	26
27	The impact of positive self-perception on psychological distress, empathy and mental resilience in individuals engaged in sports	27
28	Migration and asylum in the world of sports: Humanitarian challenges and the role of national and international institutions	28
29	Lifestyle scan as an indicator of healthy lifestyle behaviors	29
30	Assessment for learning in secondary physical education: A gymnastics intervention study	31
31	Evaluating the impact of body fat percentage on on-field performance in elite football	32
32	Cluster analysis of balance sorecard structural components applied in sport management	33
33	It's not just about winning or losing: Participation in holistic sport programs can contribute to girls' physical literacy development	34
34	Examining stress management, social support and life satisfaction in running groups	35
35	Investigation of foot biomechanics and plantar pressure in soccer players with unilateral chronic foot instability	36
36	The effect of tecnobody and cyberdyne combined exercises on the return to sport in a football player with mosaic knee plasty surgical procedure - a case report	37
37	Active mobility in childhood: Factors influencing bicycle ownership and use	38
38	Parental involvement in youth sports: An interpretive phenomenological analysis of young athletes' experiences	39
39	The relationship between motor competence and executive functions in school aged children	40
40	Differences between water and dry-land sports athletes in muscle contractile properties and functional asymmetry of the knee joint muscles measured by the method of tensiomyography (TMG)	41

TABLE OF CONTENTS
Oral Presentation

No	Title	Page
41	Perceptions of sports science students regarding the concept of nutrition	42
42	Physical education in primary education in forming a lifelong physical activity habits	43
43	Reasons for participation in sports: A qualitative research on athletes with visual impairments	44
44	Gender and age-related differences in flexibility among Albanian first and fourth graders (2013–2024)	45
45	Exploring peer teaching and living the curriculum as experiential pedagogies in the first year of initial teacher education in the Luxembourgish context	46
46	Exploring physical literacy promotion from childhood to adulthood in Serbia: Key agents, attitudes and actions	47
47	Evaluating Physical Education Instruction Models in Primary Schools: A Project Overview	48
48	Application of the FitBack Toolkit for improving the physical literacy of students in physical education classes – Serbian teachers' experiences	49
49	New Era in Sports Management Education in Turkey: Central Placement Decision	51
50	Preservation of national values for future generations: The importance of Azerbaijani national wrestling in physical education	52
51	Monitoring physical fitness to enhance the development of physical literacy in children and adolescents - Estonian example	53
52	The role of different warm-ups depending on the proposed training theme before a youth football tournament	54
53	Comparison of grip strength results in children aged 11-13 years	55
54	Can muscular fitness components predict cardiorespiratory endurance of elementary school students?	56
55	From assessment to empowerment: The FitBack toolkit's role in enhancing physical literacy	57
56	The scientific background of the FitBack platform	58
57	Assessment of physical fitness of the national wrestling athletes through the functional tests	59
58	Intrinsic and extrinsic factors in success and failure: A study on elite trampoline athletes	60
59	Specificities of metabolic and cardiovascular response as a function of performance in a specific wrestling test	61
60	Assessing graduate satisfaction: Improving the physical education teacher training program	63

TABLE OF CONTENTS
Oral Presentation

No	Title	Page
61	Perceived barriers to movement education among Turksih preschool teachers: Examining the ımpact of gender, school type and location	64
62	Investigation of youth soccer coaches teaching behaviors	65
63	Motivational characteristics of students participating in non-formal education and their relationship with age and sports achievements	66
64	The effect of physical education and sports course value and self-esteem on well-being in high school students	67
65	The effect of family harmony on academic grit in university students	68
66	Anthropometric characteristics and physical development of track and field athletes: A morphological and functional analysis	69
67	The effect of walking on akhalteke horses on the recovery of athlete's training fatigue	70
68	Perceived changes in quality physical education: impact of specialized physical education teachers on childhood and primary education trainee	71
69	Enhancing bodily awareness in preservice teachers through analogic and digital heart rate monitoring for better physical activity promotion in primary schools	72
70	Health-promoting Universities in Italy: Exploring physical activity, lifestyles, and well-being in higher education	73
71	Examination of the concepts in the context of free time and physical activity in the curriculum teaching programs	74
72	The influence of body composition on handgrip strength in young athletes	75
73	Investigation of university students' views on recreational sports and factors affecting their participation in recreational sports	76
74	The invisible physical literacy in North Macedonia physical education	77
75	Inspiring excellence: Empowering the future of physical and sport education	78
76	Team practices and coaching behaviours in professional women's soccer players: 7-day microcycle reporting in midseason	79
77	Gross motor coordination in elementary school children: A gender comparison across key movement tasks	80
78	Teacher training for motor development and the prevention of sedentary behavior: Active breaks in the primary school curriculum	81
79	Analysis of self-perception in the learning process using metacognitive strategies in physical education among 2nd year highschoolers	82
80	Motor development and related factors of children. Effects of an experimental teaching intervention with different teaching styles	83

TABLE OF CONTENTS
Oral Presentation

No	Title	Page
81	A holistic view of the athlete's personality lighted up with a spark	84
82	Physical education interventions to improve physical fitness in youth. A systematic review	85
83	Effects of teaching styles on motor competencies learning at school. Preliminary study	86
84	Evaluating PE instruction models in primary education	87
85	Classroom management strategies used by physical education teachers in Georgia	88
86	The effect of the implementation of Hellison model on primary school	89
87	The role of eastern martial arts (TAEKWON-DO) in the formation and development of motor skills in school-age children	90
88	The influence of ball handling and fatigue on cognitive reactive agility performance in basketball players	91
89	Leisure and aging: Exploring differences in activity engagement and participation motives	92
90	Factors influencing the development of PETE students self-efficacy during practicum	93
91	Primary school teacher‘s feedback and experiences from tandem teaching of physical and sports education in Slovakia	94
92	Quality physical education and sport in Africa: Introducing artificial intelligence into the teaching and training of pes instructors in national institutes of youth sport	95
93	The role of set structure in preserving performance outcomes during vertical jumping sessions	96
94	Pupils' feedback on tandem teaching of physical and sport education in primary schools in Slovakia	97
95	Increasing the inclusion of young people with special educational needs through adapted sports activities carried out on snow	98
96	How to integrate physical activities in teaching of all curriculum’s subjects in whole-day school: The review of evidence from existing european projects outcomes	99
97	The effect of yoga exercise on sleep quality, pulmonary function, some physical and psychological fitness parameters in women	100
98	Turkish validation of the adult physical literacy scale: psychometric properties	101
99	An active school supporting the dynamic function of the spine in pupils	102
100	Examination of nutritional awareness levels of high school students engaged in team sports and individual sports in terms of various variables	103

TABLE OF CONTENTS
Oral Presentation

No	Title	Page
101	What is metabolically healthy obesity?	104
102	Comparison of sports supplement beliefs of exercise and sport sciences and nutrition and dietetics students	105
103	Posture in relation to BMI index among 10-year-old elementary school students	106
104	The role of physical activity in active aging	107
105	Quality physical education and sport in africa : Introducing artificial intelligence into the teaching and training of pes instructors in national institutes of youth sport	108
106	The therapeutic power of swimming: Multidimensional development in babies with special needs	109
107	Investigation of the effect of communication skill levels of sport management department students on entrepreneurship	110
108	E-Learning attitudes of talented pre-service teachers: An empirical study on SARS-CoV-2 (COVID-19) period	111
109	Monitoring internal training load, recovery, neuromuscular performance, and muscle fatigue during a 4-week football preseason	112
110	Post-activation performance enhancement in multi- vs single-joint movements: A comparative study of bfr and ems in well-trained volleyball players	113
111	Doping through the lens of mythology	114
112	Positional demands of small-sided games: Impacts on external load in professional footballers	115
113	Psychological factors in recreational sport participation: The relationship between anxiety and well-being	116
114	The influence of the 2d:4d finger length ratio on swimming performance	117
115	Understanding motivational dynamics in personal training studios and open gyms: A self-determination theory perspective	118
116	Self-Talk and motivation as predictors of dispositional flow state in athletes	119
117	The effect of soccer-specific training on functional movement screen scores in male adolescents	120
118	Finding flow in nature: Examining the relationship between ecorecreational attitude, connectedness to nature and flow experience	121
119	Leisure experience preferences, consumption styles and life satisfaction of the recreation participants	122
120	The effects of digital fatigue levels of fitness center employees on their job performance	123

TABLE OF CONTENTS
Oral Presentation

No	Title	Page
121	Exploring the relationship between pen grip and physical activity frequency in preservice teachers	124
122	Physical literacy and leisure engagement in adults: Insights from a study in İstanbul	125
123	Investigation of leisure time management and internet use in leisure time of sport sciences students	126
124	Transcending cognitive training through spiritual leisure	127
125	Psychological reflections of wearable technologies in young elite football players: A phenomenological study	128
126	The relationship between academic focus levels and self-efficacy of sport sciences students	129
127	Effect of recreational physical activity on academic self-efficacy and stress management in universities	130
128	Determining the importance levels of recruitment criteria for health and fitness centers	131
129	Mega sporting events and their socio-environmental sustainability legacy: a critical review of the olympics and the FIFA world cup	132
130	A study on future anxiety among students of the faculty of sports sciences based on various variables	133
131	Evaluating Paris 2024: Insights from Sports Management Sciences Academics	134
132	Evidence based sport-concepts for health - From school-children to elderly	135
133	Winning on both fronts: the science of success in sport and education	136
134	School physical education reduces sedentary lifestyle and improves behavioral and metabolic indicators	137

TABLE OF CONTENTS
Poster Presentation

No	Title	Page
1	Health-behavior predictors of physical endurance among school students	138
2	Accelerometer-measured physical activity on Bulgarian students	139
3	Analysis of the forehand topspin shot in table tennis: A systematic literature review (2014–2024)	140
4	Gender differences in physical activity and sedentary behavior among students aged 9 to 11 years	141
5	Can beach soccer supplement training on conventional surface in young soccer players?	142
6	Acute effects of repetead sprint ability on landing technique in young female soccer players	143
7	Aerobic capacity and somatotype in relationships with the playing position on female football players	144
8	The effects of additional recreational football program in Serbia primary school	145
9	Application of Software for Measurement of Coordination in a Virtual Environment	146
10	Differences in dimensions of competitive anxiety in football players of various biological acceleration	147
11	Pedagogical practices and communication when working with students with special educational needs	148
12	The impact of resuming physical education classes on the physical capacity of school-aged girls in the post-pandemic context	149
13	Beijing 2022 Winter Olympics: A multi-dimensional analysis of impact and legacy	150
14	Sports development in the Commonwealth of Independent States (CIS) with the use of various activities effectiveness measure	151
15	Designing and testing an assessment tool for physical literacy in Southeastern European schools	152
16	Definition and assessment of proprioception: a literature review	153
17	Tuvan competitive game "DASH KODURERI"	154
18	The evolution of women's Olympic fencing from Paris, 1924 to Paris, 2024	155

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ORAL ABSTRACTS

Efficacy of creatine supplementation with carbohydrate restriction on long jump performance

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Abstract: Jumping events in athletics (long jump, triple jump, high jump, pole vault), 60 m (indoor) and 100 m sprints, as well as vault in artistic gymnastics, last up to 10 s, require strength and speed in combination with low relative body weight. Too much body mass is a negative factor for achievements, and the main energy mechanism for these disciplines is creatine phosphate. Consequently, creatine supplementation has an expected positive effect, but creatine is also associated with a particular increase in body mass, on average by 0.8 – 1 kg, according to various authors. This weight gain is at the expense of some muscle fluid retention. Another factor for increasing muscle fluid is glycogen, but glycogen reserves do not play a significant positive role in the sports disciplines listed. Therefore, the aim of this study was to conduct an experiment with an elite female long jumper and explore the efficacy of creatine supplementation with carbohydrate restriction on jump performance. One week before a main competition, the athlete reduced carbohydrate intake to a minimum and supplemented with 4 x 5 g/day creatine monohydrate. A 30-s continuous jump test on a force plate system was performed before and after the study intervention, and the athlete's body mass was monitored throughout the week. The results showed no changes in body mass and a significant increase in maximal rebound (48.9 cm vs 41.36 cm) and jumping endurance. Moreover, the athlete's performance at the competition was the best result in her career – 6.5 m against a maximum of 6.4 m in previous events. This supplementation regimen requires further investigation with a sufficient number of participants to prove its effectiveness.

Keywords: Creatine, supplements, long jump.

Accelerometer-measured physical activity on 5th grade students during school hours

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Abstract: Physical activity is one of the main components of the healthy lifestyle. According to World Health Organization (2020), children and adolescents should do at least 60 minutes per day of moderate- to vigorous intensity physical activity. There is evidence that 80% of adolescents do not meet the recommended levels of physical activity (WHO, 2024). Therefore, the aim of this investigation was to study the level of moderate- to vigorous intensity physical activity of 11-year-old students from private school "Dr. Petar Beron" in Sofia, Bulgaria. The investigation was held in one week in month of October in 2024/2025 academic year with 20 students from 5th grade from which 10 boys and 10 girls. There were used 3-axis logging accelerometers Axivity AX3. The measurement was conducted in natural school setting. Descriptive statistics was used for processing the data with SPSS statistics 27.0. The results show that both girls and boys met the recommended levels of physical activity mentioned below. Girls had average 146 minutes moderate- to vigorous intensity physical activity daily in school settings only. Boys had 185,7 minutes. However interesting is that only about 30 minutes (30,9 for girls, and 34,1 for boys) daily moderate- to vigorous intensity physical activity was from Physical Education lessons. For girls that is only 21,1% of physical activity with this intensity ensured from Physical Education lesson. For boys that is 18,3%. That is the students ensure bigger per cent moderate- to vigorous physical activity in the recess and lunch periods. We confirm the tendency that boys are the more active sex than girls at this age. Future investigation is needed to study how teachers can be helpful in the recess period to ensure qualitative physical activity for students.

Keywords: Daily physical activity, recess, school physical activity.

Modern learning process: teaching gymnastics with the application of kinematic modelling

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Abstract: The aim of this research was to promote a new method in teaching practice which allows a better understanding of movement in space. This method uses computer programs for the analysis of sports movements. There are few studies that examine the impact of video feedback on skill development. In this case, the analysis of a basic gymnastics exercise was carried out to facilitate the modern educational process in teaching practice. The exercise was performed at the 40th World Cup competition in Artistic gymnastics in Maribor (SLO). The kinematic parameters were determined by the Ariel Performance 3D Video System (APAS), using sixteen (16) anthropometric reference points and eight (8) body segments, of which one represents the body's center of gravity. Selected exercise was analyzed on Uneven Bars - Stalder circle to Handstand. Stalder circle to Handstand belongs to a group of basic movements and it is necessary to learn this technique on Uneven Bars, so that we can master more complex movements. The goal of this research was to explain a new way of adopting teaching practice in the students' educational process. This use of modern technologies in sports helps students to adopt the exercise much faster, by spotting their mistakes and correcting it. Research related of video techniques in sports practice requires students to think how to use this technology.

Keywords: Female gymnast, kinematics, uneven bars, technique analysis.

Physical literacy development in Lithuania: trends and challenges in pre-school education

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Abstract: Physical literacy (PL) has received a lot of attention recently as a concept that encompasses and broaden not only the school discipline of physical education (PE) but also the physical education activities carried out in pre-school educational institutions. The concept of PL describes the motivation, confidence, physical competence, knowledge and understanding that individuals develop in order to maintain physical activity at an appropriate level throughout their life. Even if it has been proposed as one of the Sustainable Development Goals by United Nations for 2030, the implementation of this concept in the educational system happens at contrasted stages in different countries. A recent review of physical literacy in Europe revealed that one of the biggest challenges facing researchers is the number of definitions, reflecting the diversity of approaches. In Lithuania the concept of physical literacy is still new and requires extensive educational research. According to WHO recommendations, Lithuania is one of the countries where the promotion of physical activity is not considered a priority. One of the reasons for this is that there are still no provisions or long-term state-funded programmes in this area at the national level and the model of physical literacy guidelines is still under development. Also it is observed that in kindergartens not only pre-school teachers but also teachers of physical education lack the competences and practical skills to organize quality physical education activities. Among the challenges related to the implementation of PL, teachers' knowledge and representations of this concept can be identified as an obstacle. For children to be physically literate throughout their lives, it is imperative that pre-school teachers use purposeful physical activities, which include physical, psychological, social, cognitive and digital skills. Focusing on pre-school teachers' competences and experiences in the context of PL development will be the main focus of the research.

Keywords: Physical literacy, pre-school education, physical education teachers.

Physiological intensity of physical workouts taking into account the individual profile and model characteristics of physical fitness in belt wrestling classes

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Abstract: The article presents information on the practical use of calculating the physiological intensity of physical activity taking into account the individual profile and model characteristics of belt wrestlers' physical fitness. The use of model characteristics of highly qualified belt wrestlers allows us to consider it as a reference indicator for planning the levels of physiological intensity of physical activity. The difference between the individual profile indicators of wrestlers' physical fitness and their model values allows us to identify and correct the shortcomings of training means' choice, change the ratio of the volume and physiological intensity of physical activity. When selecting means, it is necessary to build complex training sessions with the solution of several problems and at the same time take into account the strengths and weaknesses of the athletes' physical fitness. It is known that the model characteristics of training help specialists and athletes themselves to select and correct training effects and increase the level of training effectiveness. It makes it easier for trainers to manage the educational and training process, allow them to control the level of physiological intensity of physical activity, adjust the reserve capabilities of the body's functional systems and balance with training loads. The creation of wrestlers' model characteristics on belts is carried out in stages, due to the creation of a method for systematization and assessment of the body's functional state for timely correction of physical activity of those engaged in physical culture and sports and a computer-implemented system for its implementation. The essence of this method is to accumulate data to obtain a model profile of highly qualified belt wrestlers, taking into account their weight categories, it helps to achieve a model level of physical fitness, as well as functional and psycho-emotional state. It is possible to create stage-by-stage and promising models of wrestlers' preparedness.

Keywords: Wrestlers, intensity of loads, individual profile, physical fitness, model indicators.

The impact of sedentary behavior and organized physical activities on the development of fundamental motor skills in eight-year-old children: Application of the TGMD-2 test

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Abstract: The study was conducted on a sample of 78 eight-year-old children (37 girls and 41 boys) from two primary schools in Split, Croatia. The primary aim was to assess fundamental motor skills and examine their relationship with organized physical activities and sedentary behavior. The assessment of motor skills was conducted using the Test of Gross Motor Development (TGMD-2), which evaluates six manipulative and six locomotor skills. Additionally, a questionnaire was administered to assess the time spent in organized physical activities and sedentary behavior. The results of the correlation analysis indicated that the average number of minutes spent in organized physical activities was not significantly associated with the level of fundamental motor skills in eight-year-old children. These findings suggest that children who spend more time in sports activities do not necessarily perform better on motor skills tests. The quality and type of activities appear to be more important than the amount of time spent in them. Furthermore, the analysis did not show a significant relationship between sedentary behavior and motor skills. Although the findings of this study do not confirm previous evidence of a negative association between a lack of physical activity and motor skills, they highlight the importance of individualized programs that can improve motor skills and mitigate the potential negative effects of a sedentary lifestyle. In conclusion, the new full-day school model in Croatia presents an opportunity to integrate kinesiology activities into students' daily schedules. Organized sports activities within the school setting can facilitate the development of motor skills in a supportive environment, which may positively influence children's health and motivation for future participation in sports and recreational activities.

Keywords: Fundamental motor skills, organized physical activities, sedentary behavior, tgmd-2 assessment.

Game intelligence in sport. An exploratory sequential mixed methods design for rugby

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Abstract: The aim of the study was to explore the concept of Game Intelligence in sport of Rugby Football. Game Intelligence (GI) is often stated as a key element of high performing athletes in team sports and quoted in talent identification and talent development discussions. Very little is known about the concept in rugby football however which this study aimed to inform. Phase 1 involved a GI survey being constructed and completed by 175 rugby coaches from across the world recruited via snowball sampling through national and international rugby coaching networks. Closed and Open questions were included with the aim to explore rugby coaches' understanding of GI, to establish its key components, and to propose a working definition for rugby union that might be used to support GI development in players and coaches. Insight was gained on GI's importance, developmental practices, measurement, and responsibility. Reflexive Thematic Analysis of qualitative data provided 4 major themes of what constituted GI in rugby; Game Changing Influence, Effective Decision Making, Knowledge and Understanding of Rules, Role and Game, and Situational Awareness. This allowed a working definition of the term to be established. Following this analysis Phase 2 explored the alignment between the GI components identified in Phase 1, and the views of those working in age-grade elite rugby environments. A sub-set of performance coaches (n=9) working at professional rugby clubs within the highest English league were purposefully selected and invited for follow up interviews which took place online utilising Microsoft Teams software packages and lasted for 65-95 mins (M=75mins). Thematic Analysis using both deductive and inductive approaches established 5 major and 13 sub themes. Data were used to further develop the GI model for those coaches working at the performance level which now included a fifth component of Self which integrated will all other components.

Keywords: Rugby, intelligence, coaching, performance.

The challenges and strategies for school physical education curriculum and instruction under low fertility rates in Taiwan

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Abstract: Purpose: This study explored the impacts of Taiwan's declining student population (low fertility rate) on school physical education curricula and instruction, with a particular focus on rural areas. It also discussed the strategies schools have adopted to address these challenges. Method: The study involved 11 focus group interviews, each with approximately 10 stakeholders from various schools, including principals, directors, coaches, teachers, and parents. These interviews were conducted in different regions: three sessions in northern, central, and southern Taiwan, and one session each in eastern Taiwan and the outlying islands. The responses from frontline educators were summarized and analyzed to understand how low fertility rates affect physical education programs and the strategies schools have implemented to respond to these challenges. Results: The study identified key impacts such as fewer opportunities for peer interaction, difficulties in forming teams for competitions, and growing disparities between urban and rural schools. To address these challenges, schools adapted by merging grades for activities, adjusting competition rules, and incorporating individual sports to maintain student engagement. Conclusion: While the declining student population posed significant challenges, it also created opportunities for more personalized and collaborative learning environments. The adaptive strategies employed by schools not only mitigated these challenges but also fostered innovative approaches to physical education that catered to smaller class sizes and varying developmental levels.

Keywords: Rural education, peer interaction, urban-rural disparities, thematic analysis, focus group interview.

Creative problem solving teaching strategy in sport instructi ： Creativity is unstoppable

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Abstract: Background/Purpose: The purpose of this research was to investigate the effect of the creative purpose solving strategy (CPSS) on participants' creativity and problem-solving abilities. Method: A class of thirty-four (n=34) students participated in a 12-week intervention in this study. Participants were asked to complete the Word Remote Associates Test and Problem Solving Ability Scale three times which were on the 5th week, 10th week, and 15th week during the intervention. The descriptive and repeated measure of ANOVA was applied to analyze all the acquired data. The informal interview and class feedback were collected for the thoughts of participants. Analysis/Results: Results indicated a) The test 3 scores on creativity were significantly higher than the test 1 and test 2; There was a significantly higher score on the process and affective of problem solving on test 3 than on test 1; There was not a significantly score difference founded on the process and affective of problem solving between test 2 and test 1. The result showed the CPSS effectively improved the creativity and problem solving abilities of participants. b) CPSS was a very motivated student to learn. Students were enjoyed the process during group discussions, as well as showing their talents. However, some students felt challenged with too much work loading. Conclusions: The CPSS could be implemented well when teachers' pedagogical knowledge is prepared. The teacher should be aware of students' attendance since most of the tasks need cooperation with others, therefore, with not enough students show up the tasks could not be done and will affect the learning.

Keywords: Creative, intervention, physical education major.

Physical activity barriers perceived as a predictor of the level of nomophobia in the students of the faculty of sports sciences

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Abstract: Nowadays, when smartphones are an indispensable part of life, the presence of phone addiction (nomophobia) department in hospitals shows that this is an important public health problem. It is known that individuals of all ages show nomophobic symptoms, and most of all, young people cannot stay away from their phones. The aim of the research is to investigate whether the perceived physical activity disabilities of the students of the Faculty of Sports Sciences have an effect on predicting the levels of nomophobia. 570 student volunteers studying at the Faculty of Sports Sciences participated in the research. In the research, the Üsküdar Nomophobia scale and the Perceived Physical Activity Disabilities Scale were used. The data obtained are from Jamovi (2.3.28.0) the statistical program was analyzed according to 95% confidence interval and 0.05 significance level. According to the research results, it was determined that the participants used smartphones for social media, used the instagram application the most, and most of them had a low level of nomophobia. It has been found that there is a positive moderate relationship between the participants' nomophobia scores and physical activity disability scores. A positive multi-level relationship has been found between body mass index and body image physical social anxiety sub-dimension scores. It has been found that the model in which the physical activity disability scores perceived as a predictor of the level of nomophobia are taken into account is significant. The probability of each increase in the perceived physical activity barrier significantly predicts the probability of increasing low-level nomophobia scores by 1.9 times, medium-level nomophobia scores by 2.4 times, and high-level nomophobia levels by 5.0 times. As a result, conducting studies on the perceived physical activity disabilities of students of the Faculty of Sports Sciences may help to reduce the nomophobia levels of students.

Keywords: Physical activity disability, nomophobia, smart phone use.

Exploring the link between parent-child physical activity, parental beliefs and childhood obesity in Taiwanese preschoolers

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Abstract: This study explored the relationship between parent-child physical activity, childhood obesity, and parental beliefs about physical activity in preschool children in Taiwan. A cross-sectional study was conducted with 784 preschool children aged 3 to 6 years and their parents. Data were collected through a paper-based questionnaire from October 2024 to January 2025, covering the duration of parent-child physical activity, dynamic physical activity duration of both parents and children, children's body mass index (BMI), and parental beliefs regarding the value of children's physical activity. Correlation analysis examined the relationships among these variables. Results showed a significant but weak positive correlation between parent-child physical activity duration and children's dynamic physical activity duration. Additionally, children's BMI was weakly positively correlated with both dynamic physical activity duration and screen time. Taiwanese preschoolers engaged in an average of 90.96 minutes of dynamic physical activity per day, while their screen time averaged 98.97 minutes, indicating high sedentary behavior. Parents with stronger beliefs regarding physical activity spent more time engaging in physical activity with their children and had children with lower screen time. However, no significant association between parent-child physical activity and childhood obesity was found. Taiwanese parents' engagement in exercise and shared activities with their children remains low. Enhancing parental beliefs and encouraging family-centered interventions may help increase children's physical activity levels and maintain a healthy BMI.

Keywords: Preschooler, physical activity, parent-child exercise, sedentary behavior, parental beliefs.

The relationship between physical activity levels and fear of falling in older adults

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Abstract: Falls significantly impact older adults and individuals with disabilities, reducing mobility, increasing dependence, and lowering quality of life. Fear of falling (FoF) is a major contributing factor, influenced by gender, age, fall history, physical decline, cognitive impairment, and depression (Lavedán et al., 2018). Ambrose et al. (2013) suggested that FoF increases fall risk, while Kim and So (2013) argued that experiencing a fall heightens FoF, leading to activity restriction and further quality-of-life decline. Research by Kendrick et al. (2014) and Wetherell et al. (2018) shows that whole-body exercises (e.g., yoga, tai chi) help reduce FoF. This study examined the relationship between fall history, FoF, and physical activity levels. A total of 142 older adults (12 males, 130 females; age 76 ± 7.29, BMI 23.70 ± 3.36) participated. Questionnaires assessed fall history, FoF scale, and retrospective physical activity levels. Results showed that meeting ACSM-recommended activity levels did not significantly impact the relationship between fall history and FoF. However, hierarchical regression indicated that age, gender, BMI, and physical activity levels were significant predictors of FoF.Exercise provides both physical and psychological benefits, reducing FoF. Therefore, structured physical activity programs led by instructors or adapted physical education teachers are recommended to enhance well-being in older adults and individuals with disabilities.

Keywords: ACSM's guidelines, FoF, adapted physical education.

Sufism, the enneagram and fair play in sports: Exploring moral norms and spiritual forms of sportsmanship

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Abstract: This paper explores the intersection of Sufism and the concept of fair play in sports, with a focus on the enneagram as a model for understanding human behavior. Beginning with a review of the historical and philosophical foundations of Sufism, the paper highlights Laleh's elaboration on the enneagram within the Sufi context. This framework offers a unique perspective on human psychology, emphasizing how Sufi principles can be applied to understand behavior and ethics in various domains, including sports. Central to this exploration is the concept of jihad al-akbar - the greater jihad - which involves the internal struggle for spiritual purity. This concept is particularly relevant in examining how moral and spiritual battles within the self influence external behaviors, such as fair play in youth sports. The paper further investigates the notion of fair play in sports through two perspectives: as a moral form system grounded in Sufi teachings and as a moral norm, as discussed by philosopher Sigmund Loland. By contrasting these views, the study uncovers how fair play can be seen as an innate moral imperative, informed by internal spiritual and ethical considerations, versus a set of externally imposed social norms. This comparative analysis provides deeper insights into the moral obligations of athletes, suggesting that ethical behavior in sports may be both a reflection of personal spiritual growth and adherence to external ethical standards. Ultimately, the paper sheds light on the role of internal spiritual growth and purity in shaping fair play, offering a new pragmatical lens through which to view sportsmanship and ethical conduct in the realm of teaching physical education and sport.

Keywords: Sufism, enneagram, fair play, sport ethics.

Physical activity and body composition of primary school students in three southeastern european countries

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Abstract: Considering the health benefits of physical activity (WHO, 2020) one of the important goals of physical education is to teach students an active lifestyle (Ennis, 2017). Since physical education is a mandatory subject in all three countries and aims to prepare students for an active lifestyle, the aim of this study was to examine the physical activity levels and body composition of primary school students in three Southeastern European countries. Methods: The study included 719 schoolchildren from Serbia (n = 285), Bosnia and Herzegovina (n = 265), and Croatia (n = 169). Participants were aged between 12 to 14 years (mean = 12.72, SD = 0.66), with 49.9% of them being female. Physical activity levels were assessed using the Physical Activity Questionnaire for Adolescents (PAQ-A) (Kowalski et al., 2004). The classification of children as overweight or obese was conducted based on the approach developed by the Childhood Obesity Working Group of the International Obesity Task Force (Cole et al., 2012). Results: Regarding body composition, significant differences were observed between students from the three countries, with Croatian students showing more favorable results ($F=8.150$; $p < .001$; $\eta = .02$). Croatia had the lowest percentage of obese children. However, no statistically significant differences were found in physical activity levels between students from the three countries. Across all three countries, significant gender differences in physical activity were observed, with boys being more physically active than girls ($F = 22.014$; $p < .001$; $\eta = .03$). Conclusion: Given the importance of physical activity for long-term health and well-being, the findings suggest that physical education programs across Southeastern Europe may benefit from targeted initiatives aimed at improving body composition, particularly among children at risk of obesity, and promoting greater participation in physical activities among girls.

Keywords: Primary school, students, physical activity, body composition.

Design of an inventory for the evaluation of attitudes and teaching practices on sustainable development in physical education

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Abstract: This pilot study describes the procedure for examining the content validity and reliability of an inventory developed to measure attitudes, perceptions, and teaching practices for promoting sustainable development among physical education teachers. The study methodology included selecting and modifying existing questionnaires that have been used in similar studies. Specifically, the structure of the inventory was supported based on two previously developed questionnaires: The Attitudes and Perceptions on Education for Sustainable Development scale and the Assessment Tool for Physical Education for Sustainable Development. These questionnaires were adapted and tested for content and face validity before piloting. The main objective of the research was the pilot evaluation of the inventory, examining its internal consistency through Cronbach's a reliability coefficients and its repeatability through the test-retest reliability procedure. Thirty-two Greek physical education teachers, 8 males and 24 females, with average age 48.85 years (sd = 6.18), participated in two consecutive measurements. The results of the reliability analysis showed that the Cronbach's a coefficients for the individual factors ranged from 0.70 to 0.87, indicating adequate internal consistency. In the test-retest procedure, which was carried out with a 20-day interval between the two measurements, the results revealed satisfactory reliability in terms of the stability of the inventory in most question categories. In conclusion, the pilot study confirmed that the instrument is suitable for further use and application in a larger sample with some improvements in the individual items. The findings of the present research highlight the importance of developing valid and reliable instruments for the evaluation of education for sustainable development, particularly in the field of physical education, where the formation of sustainable attitudes is crucial for the promotion of corresponding practices in educational settings.

Keywords: Measurement reliability, physical education teachers, sustainable development, SDGs, questionnaire.

The relationship between motor fitness test complexity and executive functions in preadolescents

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Abstract: Previous research has frequently indicated a positive relationship between motor fitness and executive functions (EF) in preadolescents (Aadland et al., 2017; de Bruijn et al., 2018; Milošević et al., 2021; van der Fels et al., 2019). This relationship is commonly explained by the cognitive stimulation hypothesis, which suggests that complex coordinative motor tasks may require and enhance EF (Moreau et al., 2015; Pesce, 2012; Tomporowski & Pesce, 2019). The aim of our study was to investigate the relationship between motor fitness test complexity and EF. The sample consisted of 150 students (79 female, mean age 9.58, SD 0.28). Coordination complexity was varied through three motor fitness tests: 4 × 5-meter shuttle run, 2 × 10-meter obstacle shuttle run, and 2 × 10-meter backward obstacle shuttle run. Inhibition was measured using a computer-based Stroop task (Stroop, 1935), shifting with the Smiley task (Rogers & Monsell, 1995), and updating with the Letter Memory task (Miyake et al., 2000). The partial correlation analysis revealed that the most complex motor task showed the strongest positive correlation with the shifting ($r = .24$, $p < .01$), followed by the less complex motor task ($r = .20$, $p < .05$), while the relationship between the shifting measure and the least complex motor task was below the significance level ($r = .16$, $p > .05$). For the inhibition measure, our results showed a similar intensity of positive correlation with both the most and the moderately complex motor tasks ($r = .17$, $p < .05$), while the least complex motor task was not significantly related ($r = .04$, $p > .05$). Our findings highlight the potential importance of motor task complexity in detecting relationships with shifting and inhibition. Future research should further investigate this relationship by including a broader range of motor and cognitive tasks.

Keywords: Coordination, inhibition, shifting, updating.

Effects of six-week of high intensity resistance-based aerobic exercise on computerized dynamic posturography, functional head impulse test, and body composition scores in adult sedentary women

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Abstract: The purpose of the current research was to examine the effects of six-week of high intensity resistance-based aerobic exercise (RBAE) on computerized dynamic posturography (CDP), functional head impulse test (fHIT), and body composition (BC) scores in adult sedentary women. A total number of eighteen participants divided into experimental (EG) and control group (CG). While the participants in the EG performed the RBAE during 30-min at the 70-75% intensity of the heart rate reserve three days a week for six weeks, the CG did not attend any regular physical activity program. The BC, CDP, and fHIT measurements were performed at the beginning and at the end of the sixth week. The intensity of the training was also monitored with heart rate variability (HRV) parameters measured in each training session. At the end of the research process there were no change in any of the BC parameters both in EG and CG. Despite the sympathetic increase observed in HRV values measured in each training unit and the weekly increase in total work capacity determined by the number of sets, the lack of a change in BC parameters can be explained by the highly aerobic effect of the training, and it can be said that nutritional intake should also be controlled in order for there to be a change in BC parameters. More importantly, both groups showed no differences in fHIT scores, and the only significant changes observed in the CDP test was the improvement in the visual system and composite balance scores in the experimental group ($p<0.05$). Accordingly, it is understood that visual and composite balance scores may be preferred to measure the effect of RBAE and similar training methods on balance in sedentary women.

Keywords: Resistance training, aerobic training, high intensity training, heart rate variability, dynamic posturography, functional head impulse test.

Assessing concurrent validity and reliability of burnout measurement tools in basketball referees

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Abstract: This study examines the concurrent validity and reliability of burnout measurement tools in basketball referees and aims to determine whether these instruments effectively measure the same underlying construct. The study involved 30 basketball referees, who completed a survey utilizing three validated burnout measurement instruments: the Maslach Burnout Inventory (MBI), BIR-Basic, and BIR-Organizational Stress. The sample consisted predominantly of male referees (90.0%), with a mean age of 35.37 years (SD = 6.98). The referees had an average of 15.30 years (SD = 6.66) of officiating experience. Regarding their level of competition, 13.3% were international referees, 46.7% officiated in the A National League, 36.7% in the B National League, and 3.3% in the C National League. To evaluate concurrent validity, Pearson r correlation analyses were conducted between the scores of the three instruments. The results revealed statistically significant positive correlations between MBI and BIR-Basic ($r = 0.69$, $p < 0.01$), MBI and BIR-Organizational Stress ($r = 0.55$, $p < 0.01$), and BIR-Basic and BIR-Organizational Stress ($r = 0.62$, $p < 0.01$). Additionally, the emotional exhaustion subscale of the MBI exhibited a strong correlation with BIR-Basic ($r = 0.81$, $p < 0.01$) and a moderate correlation with BIR-Organizational Stress ($r = 0.61$, $p < 0.01$), further supporting the validity of the measurement tools. Internal consistency was assessed using Cronbach's Alpha, with all instruments exhibiting acceptable levels of reliability (MBI: 0.84, BIR-Basic: 0.90, BIR-Organizational Stress: 0.88). The emotional exhaustion subscale of the MBI demonstrated the highest reliability ($\alpha = 0.91$). These findings confirm the concurrent validity of the three instruments, as their total scores and key subscales are significantly interrelated. However, the personal accomplishment subscale of the MBI showed only a weak correlation with the other instruments, suggesting that it may measure a distinct component of burnout.

Keywords: Burnout, basketball referees, measurement validity, concurrent validity, demographic correlates.

The effect of recreatıonal therapy-based yoga practıce on depressıon, leisure satisfaction and heart rate varıatıon ın ındıvıduals age 65 and over

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Abstract: The aim of this study is to determine the effects of recreational therapy-based yoga practice on depression, leisure time satisfaction and heart rate variability in individuals aged 65 and over living in a nursing home. The method of the study is based on a randomized controlled experimental study model. The participants of this study consist of 36 elderly individuals (18 experimental, 18 control group) living in a nursing home aged 65 and over and the experimental group applied yoga for 45 min-1 hour twice a week for ten weeks while the control group did not receive any intervention. Personal Information Form, Geriatric Depression Scale-15 (Short Form), Leisure Time Satisfaction Scale and Polar H10 heart rate chest monitor measuring the parameters of Heart Rate Variability were used for data collection in the study. In the analysis of the data obtained from the study, according to the normality and homogeneity test results, Dependent Sample t-test and Independent Sample t-test were used for pre-test and post-test measurements from parametric data, and Wilcoxon sign test and Mann Whitney U were used for non-parametric data. According to the findings obtained from the study; improvement in heart rate variability parameters, decrease in depression level and increase in leisure time satisfaction were detected in the experimental group. With these results, it can be said that recreational therapy-based yoga practice regulates autonomic function in individuals aged 65 and over and is an effective intervention method in improving both mental and physical health.

Keywords: Yoga, depression, leisure, heart rate variability, nursing home.

Comparision of the effects of aerobic and resistance exercises on cardiovascular biomarkers on sedentary women

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Abstract: In this study, comparision of aerobic and resistance exercises on cardiac biomarkers in sedantary womenaged 18-25 investigated. For this purpose, 4, 15 sedantery women for aerobicgroup, 15 sedantery women for resistance group, and 15 sedantery women for control group, participatedin this study. Before the start of the training protocols, a meeting held accordingto the subjects' acquaintance with the gym and determining the anthropometric indicators and resting heartrate for the aerobic exercise group and 1 RM of the subjects for the resistance exercise grup. In Selected physical and physiological parameters compared before the study and at the end of 8 weeks, and its effect on cardiovascular biomarkers investigated. The resistance exercise protocol of this research consisted of 9 resistance exercises, which consisted of leg extension, leg curl, leg press, chest press, seated cable row, dumbbell biceps, dumbbell back arm (triceps),Cable crunch and lat pull down movements were applied. Before starting the protocol, the 1RM of thesubjects were determined and the subjects trained according to their own 1RM. The overload added to the resistance protocol were 5% proportional to the number of repetitions and sets performed each week. Before starting the aerobic and resistance training protocols, 5 ml of blood had taken from the brachial arteries of the subjects under completely hygienic conditions to determine the baseline values of the desired biomarkers such as BNP, NT ProBNP, s-ST2 and Galectin-3. Assumptions of normality of data, homogeneity of variances, and sphericity were checked using the Shapiro-Wilk test, Levin F test, and Mochli test. The 3 (group) ×2 (time) mixed analysis of variance test with Bonferroni post hoc test was used to examine within- and between-group effects. We also imported interactive effects through the synthesis of interactive effects of time in group and examined group comparisons at different times and with time effects for each group.

Keywords: Sedantery, exercise, biomarkers.

Acute effect of Yo-Yo intermittent recovery test (Level-1) performed at different times of the day on inflammation parameters

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Abstract: The aim of this study is to examine the acute effect of the morning and evening Yo-Yo intermittent recovery test on level 1 (YIRT1) inflammation parameters. Eighteen male soccer player volunteers from Serinhisar soccer team who played in the Denizli Super Amateur league participated voluntarily. YIRT1 was applied to the athletes on two different days, morning and evening. Blood samples were collected before, during and 2 hours after the test. During the test, the total distance was recorded. At the end of the test, lactate values were measured. For İrisin hormone measurement and plasma TNF-α, IL-6, IL-1β measurements; human TNF-α, IL-6, IL-β and FNDC5 ELISA kit was used. In the statistical analysis, the normality distribution of the data was examined with Shapiro-Wilk test. Since the data showed a normal distribution, t-test for dependent groups and one-way analysis of variance (ANOVA) for repeated measures were used to compare the differences between dependent groups. There is no statistically significant difference in intragroup comparisons of İrisin and IL-6 in the morning and evening ($p>0.05$). There is a statistically significant difference in TNF-α value in intra-group comparisons in the morning ($p<0.05$), and no statistically significant difference in evening intragroup comparisons ($p>0.05$). There is no significant difference in İrisin, TNF-α, IL-6, IL-β parameters when comparing all measurements made in the morning and evening between groups ($p>0.05$). There was a statistically significant difference between morning and evening measurements in blood lactate and distance traveled after the YIRT1 test ($p<0.05$). It has been observed that exercise in the evening affects the results more than exercise in the morning. YIRT1 test test, which is used to determine the physical capacity of the players, has been found to affect the inflammation values.

Keywords: Yo-Yo intermittent recovery test level 1 (YIRT1), inflammation parameters, soccer.

Beyond playgrounds: Equipping educators and coaches as agents of physical activity through EduPASS modular upskilling

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Abstract: This study presents the EduPASS project, an Erasmus+ initiative (2022–2024) that addresses the critical need for high-quality physical activity, movement, play, and sport. It is designed to advance non-formal (e.g., kindergartens, after-school programs) and informal (e.g., sport clubs) education in physical activity and sport by strengthening the professional competencies of Early Childhood Educators and Youth Sport Coaches. The project developed a comprehensive, competency-based modular framework, integrating theoretical, practical, and evaluative components into an innovative online teaching platform (https://edupass-project.eu/). Grounded in an extensive literature review and a Delphi study, the initiative established detailed competency-based profiles that emphasize the four interrelated dimensions of knowledge, skills, attitudes, and values. These profiles underpin six core training modules, each structured to deliver 30 teaching hours and adaptable to diverse educational contexts and national frameworks, as illustrated by best-practice examples from Spain, Ireland, Luxembourg, and Germany. A key feature of EduPASS is its curricular flexibility, which permits institutions to modify the distribution of lectures, workshops, and self-directed studies without compromising the overall workload, thereby accommodating varying learner needs and institutional priorities. In parallel, the project introduced a robust evaluation tool based on Kirkpatrick's multi-level model to assess participant satisfaction, learning progress, behavioral change, and knowledge retention, ensuring continuous quality improvement of the educational content. By seamlessly integrating a theoretically sound framework with practical, hands-on learning opportunities, EduPASS offers a scalable model for enhancing early childhood and youth sport education across Europe. The outcomes of this project not only provide actionable insights for policymakers, educators, and sport coaches but also establish a foundation for future adaptations in higher education and professional development settings, optimizing educator and coach preparedness, and ultimately contributing to the promotion of lifelong physical literacy and the holistic wellbeing of children and young people.

Keywords: Early childhood educator, youth sport coach, physical activity, competency-based education, modular training.

Examining the effect of professional bodybuilders' social media use on body satisfaction and narcissism levels

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Abstract: Bodybuilding is not only a physical activity but also a lifestyle that influences self-perception and social approval. Social media serves as a platform for individuals to showcase their appearance and seek validation, potentially affecting narcissistic tendencies. Few studies focus on professional bodybuilders, where physical appearance is central. This research examines the impact of social media use on body satisfaction and narcissism in professional bodybuilders. The sample included 104 volunteer professional bodybuilders (26 female, 78 male). Data were collected using the Personal Information Form, Social Media Usage Scale, Body Satisfaction Scale, and Narcissistic Personality Inventory. Independent Sample T-Test, ANOVA, Tukey HSD, and Pearson correlation tests were conducted using IBM SPSS Statistics 29.0, with significance set at $p<0.05$. Results showed a significant difference in the exhibitionism sub-dimension of narcissism based on gender ($p<0.05$), but no significant differences were found in social media use or body satisfaction ($p<0.05$). Age did not significantly affect social media use, body satisfaction, or narcissism ($p<0.05$). A significant correlation was found between social media use and body satisfaction ($p<0.05$). Social media use was significantly related to body satisfaction among professional bodybuilders. Given the complexity of psychological tendencies in bodybuilders, further research is needed to better understand these effects.

Keywords: Bodybuilding, social media use, body satisfaction, narcissism.

Sex differences in students' motivation for running

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Abstract: With hypokinesia being often manifest among students, motivation for participation in sports activities, such as running, is a concern of particular interest (Chernozub et al., 2024). Previous studies showed that female and male runners have profoundly different motivations to participate in increasingly popular long-distance running (Waśkiewicz et al., 2019). Nevertheless, studies so far have not assessed students' running motivation using a standardised questionnaire. Therefore, this paper aimed to evaluate sex differences in students' motivation for running. We hypothesised that psychological, health, and social factors will motivate female students more, contrary to achievement motives. A total number of 321 students worldwide (162 males and 159 females) completed the standardised Motivations for Marathon 56-item questionnaire, consisting of 9 subscales (Masters et al., 1993). T-test for independent samples showed significant sex differences in General health ($p < 0.001$), Affiliation ($p = 0.004$) and all psychological scales (Coping, Self-esteem and Life meaning; $p < 0.001$), indicating higher scores in females than male students. In contrast, male students had significantly higher scores on the Competition scale ($p < 0.001$) than females. Weight concerns, Recognition and Personal goal scales showed no significant sex differences. In line with our hypothesis, we can conclude that female students' motivation for running mostly relies on psychological and health motives. In contrast, male students only differentiate themselves from their female colleagues in competition motives. Running coaches in collegiate teams or student organisations interested in engaging students in running could benefit from these results by profoundly understanding the sex differences in students' motivation. For example, they can organise running activities for female students focused on stress relief or health improvement while providing their male colleagues with more race-related running activities.

Keywords: Marathon, psychology, health, fitness, competition.

Effects of neuromuscular exercise strategies on injury risk profile

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Abstract: This study aimed to assess the injury risk profiles of soccer players aged 15-18 and examine the effects of neuromuscular exercise strategies on injury risk. A total of 44 male soccer players voluntarily participated. Injury risk analysis was conducted using Selected Functional Movement Assessment (SFMA), Lower Quadrant Y Balance Test (YBT-LQ), Upper Quadrant Y Balance Test (YBT-UQ), Functional Movement Analysis (FMA), jump tests, and muscle strength tests. Participants were randomly assigned to two groups: the control group followed their regular warm-up routine for eight weeks, while the experimental group incorporated F 11+ based neuromuscular exercises into their warm-up program. Flexor muscle activation was significantly higher during spin throw techniques performed with eyes open ($p=0.011$), whereas extensor muscle activation was more pronounced in spin throw techniques performed with eyes closed ($p=0.031$). Ball velocity was associated with flexor muscle strength; however, no statistically significant differences in ball velocity were found across different throwing techniques or visual conditions ($p>0.05$). These results suggest that ball velocity, a key performance metric, is primarily influenced by upper-extremity flexor muscle strength rather than visual acuity. Furthermore, implementing a preseason group injury prevention training program, combined with individualized corrective exercises, led to a statistically significant reduction in injury risk levels. The most notable improvement was observed in athletes classified as Moderate Risk, who transitioned to the Slight Risk category. Additionally, three athletes initially categorized as Substantial Risk moved to the Slight Risk category, though this change did not reach statistical significance. These findings highlight the importance of targeted training interventions to enhance technique, improve ball velocity in Goalball athletes, and reduce injury risk in soccer players.

Keywords: Neuromuscular exercise, injury risk analysis, soccer, functional movement assessment, injury prevention.

Comparing the acquisition of fundamental movement skills in half-day schooling and extended school program

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Abstract: The movement skill development in childhood plays a crucial role in later sports and daily activities and can be influenced by different forms of school programs. The aim of this study was to compare the development of fundamental movement skills in children enrolled in half-day schooling (N = 34) and extended school programs (N = 39). T-test statistics were applied to determine differences between the two groups in various movement abilities, including object control skills, surmounting obstacles skills, resistance overcoming skills, and space covering skills. The results indicate that boys from half-day schooling achieved statistically significantly better results in object control skills, particularly in rolling the ball by hand to a wall ($t = 3.19$, $p < 0.001$), rolling the handball around cones ($t = 2.19$, $p < 0.05$), and tossing and catching a volleyball against the wall ($t = 2.39$, $p < 0.05$). Additionally, they performed better in surmounting obstacles skills, including running across obstacles ($t = 2.94$, $p < 0.05$), crawling through obstacles ($t=2.43$, $p < 0.05$) and in space covering skills: straight running ($t = 2.28$, $p < 0.05$), and beam walking ($t = 2.57$, $p < 0.05$), compared to boys in extended school programs. Among girls, differences were observed in favor of those from half-day schooling, particularly in object control skills, including dribbling the football around cones ($t = 3.16$, $p < 0.001$), rolling the ball by hand to a wall ($t = 2.56$, $p < 0.05$), and dribbling the handball around cones ($t = 2.29$, $p < 0.05$). The results suggest that children in half-day schooling demonstrate better fundamental movement skills, while the differences in favor of children in extended school programs are less pronounced. These findings highlight the importance of school program structure in optimizing children's fundamental movement skills development.

Keywords: Fundamental movement skills, half-day schooling, extended school program, school program structure.

The impact of positive self-perception on psychological distress, empathy and mental resilience in individuals engaged in sports

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Abstract: While the positive effects of sports on individuals' psychological health are well-documented, this study presents striking findings on how positive self-perception shapes these effects. The aim of this study is to examine the effects of positive self-perception on psychological distress, empathy levels, and mental resilience levels in individuals who engage in regular sports. The research was conducted with the participation of 303 male and female athletes aged 18 and over, involved in individual and team sports in Aydın province. The data collection tools used were the Oxford Positive Self-Perception Scale, the Empathy in Sports Environment Scale, the Depression-Anxiety-Stress Scale, and the Mental Resilience Scale. Upon examining the skewness and kurtosis values, it was determined that the data showed a normal distribution. In the data analysis phase, descriptive statistics, independent samples t-test, One-Way ANOVA, Pearson Correlation, regression analysis, and Tukey tests were utilized. The results of the correlation analyses indicated that the level of sports experience significantly affects the psychological factors such as positive self-perception, empathy, and mental resilience. Experienced athletes (Semi-Professional and Professional) scored higher in positive self-perception, empathy, and mental resilience compared to amateur athletes, who had lower scores. However, sports experience did not have a significant effect on psychological distress such as depression and anxiety. Yet, higher levels of stress were observed in professional-level athletes. These findings suggest that sports experience can significantly affect individuals' psychological traits, and as experience increases, positive self-perception, empathy, and mental resilience are strengthened. However, negative psychological states such as stress, depression, and anxiety do not always change in parallel with the level of experience. A more detailed examination of the effects of demographic factors such as gender, age, and experience levels on psychological well-being may contribute to the development of healthier and more effective sports programs.

Keywords: Athlete, positive self-perception, empathy, mental resilience, professional level.

Migration and asylum in the world of sports: Humanitarian challenges and the role of national and international institutions

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Abstract: Supporting refugee and migrant athletes is not merely a sports-related issue but rather a humanitarian and international responsibility. Migrant athletes face numerous humanitarian challenges that affect both their lives and professional careers. Among the most prominent of these challenges are the psychological traumas they experience as a result of leaving their homelands and being separated from their families, making it difficult for them to adapt to new cultures. Language and cultural barriers can also hinder communication due to their cultural or ethnic backgrounds. Additionally, legal difficulties present another significant obstacle, as some athletes suffer from unstable legal statuses, which impedes their freedom of movement and their ability to participate in international competitions. National and international sports institutions play a vital role in supporting refugee and migrant athletes. The International Olympic Committee (IOC) has established a special Olympic Refugee Team, which allows refugee athletes to participate in the Olympic Games and represent their cause on the global stage. Likewise, some sports federations, . Non-governmental organizations such as Right to Play also contribute by offering psychological and social support to young refugee and migrant athletes. Local clubs play a role in welcoming them and providing opportunities to train and play on their teams, which helps improve their chances of adaptation and integration. This study sheds light on the issue of athlete migration and asylum, highlighting successful international experiences that support refugee athletes—such as the Olympic Refugee Team initiative launched by the IOC. This initiative has supported refugee athletes from conflict-affected countries like Syria and South Sudan, with several of them participating in the Olympic Games in Rio 2016 and Tokyo 2020. These efforts have enabled athletes to return to global competition and send a message of hope and perseverance to refugees around the world.

Keywords: Migration, humanitarian challenges.

Lifestyle scan as an indicator of healthy lifestyle behaviors

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Abstract: This study examines preliminary data obtained from a lifestyle scan, a tool designed to assess and promote healthy lifestyle behaviors. The scan, designed to quantify the frequency of physical activity, dietary choices, and stress management practices, utilizes self-reported data to enable individual reflection and potential behavioral modification. As part of the ERASMUS+ Sport "Healthy Lifestyle Network Europe" (HLNE) project, this research aims to contribute to the project's goal of engaging 50,000 consumers in lifestyle assessments. Preliminary data, derived from 1,348 completed scans across 31 European countries, reveal demographic insights: a predominantly female sample (61.8%), with a significant proportion aged 18-30 (38.7%), and notable participation from Lithuania, the Netherlands, and Spain. Analysis of the scan results indicates concerning trends in physical activity, with only 19% of respondents engaging in moderate exercise three times weekly and 12.2% reporting no physical activity. Conversely, muscle training is moderately practiced, with approximately 44% engaging in it two or three times per week. Dietary habits exhibit variability, with 32.3% consuming daily fruits and 36% consuming daily vegetables, while a substantial minority report infrequent consumption of legumes and nuts. Regarding stress management, 26.6% practice daily relaxation techniques, with mindfulness and yoga being prevalent. These findings underscore the scan's potential as a diagnostic tool and highlight the need for targeted interventions to enhance healthy lifestyle adoption across diverse populations.

Keywords: Lifestyle, health, exercise, nutrition, mindset.

Assessment for learning in secondary physical education: A gymnastics intervention study

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Abstract: Contemporary literature delineates three primary forms of formative assessment: teacher feedback, peer assessment, and self-assessment. This study aimed to evaluate the efficacy of peer assessment in the acquisition of selected gymnastic movements among sixth-grade students, in comparison to the provision of feedback by a Physical Education (PE) teacher. Furthermore, the study sought to ascertain the impact of implementing peer assessment on the students' ability to objectively and accurately evaluate their peers' execution of chosen gymnastic elements. The research was conducted over six instructional sessions and took the form of a two-group, concurrent experiment. The research cohort comprised sixth-grade students, with those in the experimental group (n=9) utilizing peer assessment during the acquisition of the specified gymnastic elements. The control group consisted of other students from the same class (n=7), whose formative assessment consisted of teacher feedback. Data collection was facilitated through expert evaluation. For statistical analysis, the Wilcoxon T-test and the Mann-Whitney U-test were employed, and practical significance was determined using Cohen's d. Significant improvements in the performance level of the assessed gymnastic movements were observed in both the experimental group ($p<0.01$, $d=0.84$) and the control group ($p<0.05$, $d=0.89$), demonstrating that peer assessment supports student learning in the acquisition of fundamental gymnastic movements. Although statistical analysis did not reveal a significant difference in the effectiveness of peer assessment and teacher feedback on the acquisition of the selected exercises, a tendency towards greater improvement was noted in the experimental group compared to the control group (6.22 vs. 5.29 points/student). This trend is supported by the practical significance of a small effect ($d=0.34$). However, the results did not demonstrate a statistically significant difference between the groups in students' ability to evaluate their peers' performance of gymnastic elements.

Keywords: Peer Assessment, physical education, floor gymnastics, secondary school, motor skill acquisition.

Evaluating the impact of body fat percentage on on-field performance in elite football

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Abstract: This study aimed primarily to investigate the impact of morphological characteristics, specifically body fat percentage, on the quality of football refereeing. A secondary objective was to establish the morphological profile of elite football referees officiating in the highest competitive tier in Croatia. The sample comprised 17 referees, representing the entire population of individuals authorised to officiate in the Croatian First Football League during the 2022/2023 season, under the auspices of the Croatian Football Federation. Using simple linear regression analysis, the relationships between anthropometric and morphological variables, measured according to standardised anthropometric protocols, and the quality were examined. Analysis did not reveal a statistically significant association between body fat percentage and quality of refereeing ($p = 0.476$). Furthermore, the Durbin-Watson test, with value of 2.115 indicates the absence of autocorrelation among residual values, thereby demonstrating the independence of residuals and the absence of intercorrelation between variables. The hypothesis positing a significant association between an elevated percentage of body fat in football referees and a lower quality of refereeing quality was tested and subsequently rejected, given the lack of statistical significance. Despite the observed variability in the percentage of body fat within the referee population, no statistically significant relationship with the quality of the field performance was identified. It is postulated that, should the sample or the qualitative ranking of participants exhibit greater heterogeneity, a statistically significant association with refereeing quality may potentially be established.

Keywords: Body fat, elite referees, refereeing quality, football.

Cluster analysis of balance sorecard structural components applied in sport management

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Abstract: The Balanced Scorecard (BSC) is a performance evaluation tool and a strategic framework for organizational change and planning. This study applies cluster analysis to examine the structural components of the BSC in Romanian sports management, identifying key performance indicator (KPI) groupings that influence both evaluation and strategic transformation. Analyzing data from sports organizations, we classify KPIs into meaningful clusters that guide decision-making, resource allocation, and long-term planning. Our findings highlight how BSC can be leveraged to drive organizational change, improve strategic alignment, and optimize sports management practices. This study contributes to the data-driven evolution of sports management, offering actionable insights for stakeholders aiming to enhance performance assessment and implement structured, strategic change initiatives.

Keywords: Sport management, cluster analysis, structural components, balance sorecard.

It's not just about winning or losing: Participation in holistic sport programs can contribute to girls' physical literacy development

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Abstract: Physical literacy (PL), synonymous with the adoption of active habits, is associated with multiple benefits for children's health and development. However, there is currently no clear evidence on how PL can be nurtured in various movement settings, as research in the field employs diverse methodologies, and only a few studies align with PL's holistic nature throughout the intervention process (e.g., interpretation of PL, content, outcomes). Interestingly, even fewer PL studies have been conducted in after-school sports settings, and none have exclusively focused on girls, who are generally less physically active than boys. Given that gymnastics is considered an ideal context for fostering children's PL, this study evaluated the impact of a gymnastics program, grounded in PL theory, on the PL levels of female participants. A total of 77 girls (9.2 ± 1.3 years) participating in an after-school gymnastics program were assigned to either a control group (N = 33) or an experimental group (N = 44). The Greek version of the Physical Literacy in Children Questionnaire was used before and after the 10-week intervention program to assess participants' total PL and its domains (physical, psychological, social, and cognitive). Analyses of variance for the total PL score and each PL domain indicated that the interaction effects between group and time were not significant ($p > .05$), nor were the main effects ($p > .05$). However, paired-samples t-tests conducted separately for each group revealed that the experimental group showed a significant improvement from baseline to posttest in both perceived PL and physical domain ($p < .05$). It is suggested that gymnastics programs addressing outcomes across multiple domains can contribute to shaping girls' positive PL perceptions, thereby enhancing their chances of adopting an active lifestyle. Other sport-specific programs that focus not only on performance outcomes may have a similar impact.

Keywords: Non-competitive sport, physical activity, healthy habits, childhood.

Examining stress management, social support and life satisfaction in running groups

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Abstract: The aim of this study is to examine the mediating role of coping with stress through leisure in the relationship between perceived social support and life satisfaction among recreational runners, using structural equation modeling (SEM). A predictive correlational research design, which is a subtype of relational screening models, was employed. The data were collected using the Coping with Stress Through Leisure Scale, the Multidimensional Scale of Perceived Social Support, and the Satisfaction with Life Scale. The study sample consisted of 361 recreational athletes (147 female, 214 male) who participated in running events organized in and around Mersin. Before conducting the analysis, z-scores were calculated to identify univariate outliers, and Mahalanobis distances were computed to detect multivariate outliers. Skewness and kurtosis values were examined to test for normality. Additionally, variance inflation factor (VIF) and tolerance values were evaluated to check for multicollinearity. These procedures confirmed the suitability of the data for analysis. The measurement model was tested through Confirmatory Factor Analysis (CFA), and model fit indices were assessed. Subsequently, the relationships among variables were analyzed using SEM. The findings revealed a significant relationship between perceived social support and life satisfaction ($\beta = .37$). When the coping with stress variable was added to the model, the relationship slightly weakened ($\beta = .33$) but remained significant. Furthermore, perceived social support was found to significantly predict coping with stress ($\beta = .26$). These results indicate that coping with stress through leisure plays a partial mediating role in the relationship between perceived social support and life satisfaction. Overall, the findings suggest that social support and effective stress management strategies are crucial factors in enhancing the life satisfaction of recreational runners.

Keywords: Recreational running, leisure, mediation.

Investigation of foot biomechanics and plantar pressure in soccer players with unilateral chronic foot instability

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Abstract: Objective: Chronic ankle instability (CAI) is a prevalent condition characterized by recurrent ankle sprains and persistent instability, particularly following lateral ankle sprains (LAS). The prevalence of CAI in soccer players ranges from 20% to 37%, presenting significant concerns for athletic performance and health. However, the specific risk factors contributing to CAI in this population remain unclear. This study aimed to identify key risk factors associated with CAI in soccer players. Method: Twenty-four soccer players participated, including 12 with unilateral CAI and 12 matched healthy controls. Sociodemographic data were collected, and the Cumberland Ankle Instability Tool (CAIT) was used for assessment. Static plantar pressure analysis was performed using a pedobarography device (Analiz Sistem, Istanbul, Turkey). Additionally, the Navicular Drop Test (NDT), subtalar pronation angle, and navicular-medial malleolus distance were measured using a goniometer. Data normality was assessed with the Shapiro-Wilk test. Between-group comparisons were conducted using the independent t-test and Mann-Whitney U test, while the effect of playing position on CAI risk was analyzed using one-way ANOVA and the Kruskal-Wallis test. Results: The mean age of players with CAI was 23.33±2.93 years, with a BMI of 25.16±3.23 kg/m², while the healthy controls had a mean age of 24.83±3.59 years and a BMI of 24.58±2.19 kg/m². CAIT scores were significantly lower in the CAI group ($p<0.001$). The navicular-medial malleolus distance was significantly greater in players with CAI ($p=0.000$). Plantar pressure analysis showed increased heel pressure in the CAI group ($p=0.032$). No significant association was found between playing position and CAI ($p>0.05$). Conclusion: Increased plantar pressure in the heel and a navicular-medial malleolus distance greater than 4.65 cm were identified as significant risk factors for CAI. A thorough biomechanical assessment and targeted foot core exercises may help prevent CAI and reduce ankle injury risk in soccer players.

Keywords: Chronic foot instability, foot biomechanics, soccer player, plantar pressure.

The effect of tecnobody and cyberdyne combined exercises on the return to sport in a football player with mosaic knee plasty surgical procedure - a case report

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Abstract: Articular cartilage has limited regenerative capacity, increasing the risk of functional loss and degenerative joint disease after injury. Consequently, return to sport following surgical intervention is complex and prolonged due to biopsychosocial factors. This study aimed to examine the effects of a combined exercise program on the return to sport in a soccer player after mosaicplasty surgery. Method: A 30-year-old male soccer player (height: 180 cm, weight: 70 kg, BMI: 21.6 kg/m²) who underwent mosaicplasty for a knee cartilage injury participated in a 6-week rehabilitation program. The exercise regimen included five sessions per week, each lasting three hours. Gait parameters were assessed pre and post-intervention using the TecnoBody Walker View 3.0 SCX system, while static balance was evaluated with the TecnoBody D-Wall device. Following rehabilitation, the athlete transitioned to field exercises, integrating feedback from both the D-Wall and Cyberdyne devices. Results: Post-intervention assessments demonstrated notable improvements. Gait performance on the Walker View 3.0 SCX device improved, and range of motion (ROM) increased in trunk, hip, and knee flexion. Trunk flexion ROM decreased by 29.72%, while hip flexion ROM increased by 18.52% (left) and 20.30% (right). Knee flexion ROM improved by 3.88% (left) and 17.78% (right). Step length increased by 13.72% (left) and 12.49% (right). Balance assessment via the D-Wall device showed a 19.82% reduction in the ellipse area (open-eye) and a 13.95% decrease (closed-eye). Conclusion: A structured exercise program incorporating Cyberdyne and TecnoBody technologies significantly improved gait performance, balance, and ROM, facilitating a successful return to training after mosaicplasty surgery. These findings underscore the effectiveness of a multifaceted rehabilitation approach in optimizing post-surgical recovery in athletes.

Keywords: Mosaicplasty surgery, return to sport, hybrid assistive limb, TecnoBody.

Active mobility in childhood: Factors influencing bicycle ownership and use

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Abstract: This study investigates the main factors that influence children's ownership and use of bicycles in the region of Attica, Greece, which contributes to the development of their motor skills and active mobility. Despite the well-documented benefits of cycling for physical health, environmental sustainability and social well-being, previous research shows that while 98% of children learn to cycle, only a small proportion continues to cycle regularly into adolescence. Factors such as parental influence, educational attainment, gender and socio-economic background play a key role in shaping cycling habits. A total of 659 students (mean age: 12.11 ±2.26 years), 311 boys and 348 girls, from primary and secondary schools participated in the study. Data were collected through structured questionnaires, examining demographic data, travel habits and perceptions of cycling. Statistical analysis (descriptive statistics, chi-square tests and logistic regressions) was performed using RStudio to determine the relationships between age, gender, socioeconomic status (SES), bicycle ownership and use. Key findings: (1) Age was the strongest predictor of bicycle ownership, with younger children (8–13 years old) significantly more likely to own a bicycle [$\chi^2(10)=47.41$, $p<0.001$]. However, it declines significantly after the age of 14 ($B=-0.278$, $SE=0.065$, $p<0.001$). (2) Gender did not significantly influence ownership ($p>0.05$); however, males were more likely to use a bicycle regularly ($B=0.663$, $SE=0.313$, $p=0.034$). (3) SES was positively associated with bicycle ownership ($B=0.538$, $SE=0.244$, $p=0.027$), but did not significantly influence use ($p>0.05$). The study highlights age as the primary factor in bicycle ownership, while gender influences usage rather than possession. SES affects ownership but not cycling frequency. To sustain engagement beyond childhood, interventions should focus on cycling education, infrastructure, and incentives, ensuring cycling remains a lifelong, sustainable mobility choice.

Keywords: Bicycle ownership, active transportation, socioeconomic status, cycling education, sustainable mobility.

Parental involvement in youth sports: An interpretive phenomenological analysis of young athletes' experiences

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Abstract: Organized sports, recognized as one of the most prevalent activities worldwide, with a significant number of children participating from their early educational years. Researchers have emphasized that a lack of parental encouragement and support during this critical developmental stage can lead to adverse effects, including heightened anxiety, decreased enjoyment, reduced motivation, and ultimately, withdrawal from sports participation (Lienhart & Nicaise, 2022). Within this scope, the study aims to ascertain the experiences of young athletes regarding their interactions with parents, coaches, and teammates, particularly in terms of their behavior during training, competitions, and social interactions off the field. An interpretive phenomenological approach was employed, utilizing an open-ended questionnaire combined with photo elicitation, targeting 17 young footballers aged 10-12, all of whom were from the same club. The findings indicate that parents play a significant role in shaping the young athlete's experience, providing encouragement, emotional support, guidance, and constructive criticism. While most athletes perceive their parents as motivational and psychological stabilizing influences, others express concerns over-involvement, which they experience as a pressure that undermines their perception of autonomy. Furthermore, the research findings underscore the importance of the coach-athlete relationship, which is characterized as a delicate balance between authority and guidance (Pill et al., 2022). Peer relationships within the team were also found to be crucial in forming social bonds and establishing a team identity. Young athletes appreciate encouragement and support from their peers, but there are also moments of competition and emotional tension. The study emphasises the importance and need of organized parental guidance that prioritizes encouragement over criticism, while coaches should adopt an integrated approach that forces skill development in tandem with psychological development. These findings have implications for policymakers, coaches, and sport psychologists aiming to create positive and developmentally supportive sport settings for young athletes.

Keywords: Positive athletic experience, youth, support, autonomy, pressure.

The relationship between motor competence and executive functions in school aged children

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Abstract: It is well-known that motor competence (MC) and executive functions (EFs) develop concurrently during childhood and are important factors for children's health and development. This study aimed to examine the relationship between MC and EF in school aged children. In total, 550 participants (Mage= 9.87, SD= 1.14 years) from Athens took part voluntarily. Their MC was assessed with the Körperkoordinationstest für Kinder (KTK), and two object control tasks from Bruininks-Oseretsky Test of Motor Proficiency, second edition (BOT-2). Their EFs were assessed with the Attention Network Test (for inhibitory control) and the Digits Backwards Test (for working memory). Reaction time, accuracy, and executive attention (calculated as the difference in reaction time between congruent and incongruent trials) for inhibitory control and correct answers for working memory were used for the statistical analysis. Correlation analysis, controlling for age, revealed that both KTK and BOT-2SF scores had significant positive correlations with working memory ($r = .154$, $p < .001$ and $r = .129$, $p < .01$, respectively). For inhibitory control, the sum score of BOT-2SF tasks correlated significantly with reaction time ($r = -.227$, $p < .001$) and accuracy ($r = .166$, $p < .001$) in both congruent and incongruent trials ($r= -.194$, $p < .001$, $r = .112$, $p < .01$, respectively), but not with executive attention ($p > .05$). KTK scores correlated significantly with reaction time in congruent ($r = -.180$, $p < .001$) and in incongruent trials ($r = -.207$, $p < .001$), as well as with accuracy in incongruent trials ($r = .116$, $p < .01$) and executive attention ($r = -.113$, $p < .01$). Our findings are consistent with recent meta-analytic evidence indicating a small to moderate positive relationship between MC with EF. Considering the results, the importance of fostering both motor and cognitive skills in childhood is emphasized.

Keywords: Motor skills, inhibitory control, working memory.

Differences between water and dry-land sports athletes in muscle contractile properties and functional asymmetry of the knee joint muscles measured by the method of tensiomyography (TMG)

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Abstract: This study aims to determine the influence of water-based physical activities on muscle contractile properties and functional asymmetry by investigating the differences between top-level water and dry-land sports athletes. The sample was composed of 20 participants divided into two groups: water sports athletes (swimming, water polo; N = 10; age = 20.4±1.7 y, body height = 186±3.1 cm, body weight = 83.7±8.6 kg) and dry-land sports athletes (combat sports; N = 10; age = 22.8±3.1 y, body height = 179.3±7.3 cm, body weight = 77.1±6.6 kg). Muscle contractile properties (contraction time – Tc, delay time – Td, sustain time – Ts, maximal displacement – Dm, relaxation time - Tr) were measured by the method of tensiomyography (TMG) on the right leg knee joint extensor and flexor muscles Rectus femoris (RF), Vastus medialis (VM), Vastus lateralis (VL) and Biceps femoris (BF), while functional asymmetry was calculated using the equation proposed by the manufacturer and previous studies. The results of MANOVA and t-test revealed no significant general differences in measured contractile properties ($F = 3.059$, $p = 0.274$) between water and dry-land sports athletes. The only significant difference existed in the individual parameter Tc of VM muscle ($p = 0.048$), where water sports athletes had lower values than dry-land sports athletes. Additionally, there was no significant difference in functional asymmetry between groups ($t = 518$, $p = 0.611$). These results indicate that practicing physical activities in water does not influence the muscle contractile properties or functional asymmetry of knee joint muscles differently compared to dry-land physical activities.

Keywords: Water athletes, dry-land athletes, muscle contractile properties, functional asymmetry.

Perceptions of sports science students regarding the concept of nutrition

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Abstract: The aim of this research is to determine the perceptions of sports sciences faculty students regarding the concept of "nutrition" through metaphors. The participants of the study are 114 students from Gümüşhane University Faculty of Sports Sciences. The data of the research was obtained by each student completing the sentence "nutrition is like... because...". "Content analysis" was used to analyze the data. 67 metaphors were created by the students and collected under 3 categories. 54.4% of the students perceive the concept of nutrition as a physiological need. They expressed this with metaphors such as lifeblood, gasoline, breath, oxygen. 34.2% of the students consider nutrition as a healthy life. This situation was expressed with metaphors such as activity, sports, vitamin, renewal. 22.8% of the students consider the concept of nutrition as an emotional meaning. This situation was expressed with metaphors such as father, lover, hobby, teacher. It was determined that the majority of the students (92.1%) developed positive metaphors related to sports and 7.9% developed negative metaphors. It is seen that students use metaphors such as gold, breath, oxygen, water, fuel more frequently. It is remarkable that these metaphors are necessary for life and are valuable in material terms. These results show that students are aware that nutrition is essential for life and very valuable in the world of meaning. In addition, emotional metaphors such as love, affection, lover were developed in abstract concepts such as life, health, lifestyle. Chi-Square (X2) test was conducted to compare the groups of metaphors created according to the characteristics of the participants. No significant difference was observed in the categories of metaphors created by the athletes according to being a licensed athlete, taking a sports nutrition course, and adequate and balanced nutrition.

Keywords: Nutrition, metaphor, sports sciences, qualitative research.

Physical education in primary education in forming a lifelong physical activity habits

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Abstract: The aim of the study is to determine the perceptions of classroom teachers in terms of the realization of physical education and game course goals and achievements, the current situation of the course in teacher training programs and to present inferences for the future. Literature review and document review methods, which are among the qualitative research methods, were used and 22 articles and 16 theses written between 2005 and 2024 on physical education and game course practices and the weekly course programs of the education faculties for the 2024-2025 academic year were scanned and examined in terms of the course's inclusion in the program, its processing and its faculties. In the studies, class teachers think that they did not receive sufficient training in their undergraduate education, the lesson was not carried out in accordance with its purpose and the targets were not transformed into behavior, the deficiencies of different lessons were covered during the lesson hours, and the school administration and parents did not give the necessary importance to the lesson. It was determined that in 37 of the 72 faculties of education where the Game and Physical Activities Teaching course was taught and in only 6 of the 47 faculties of education, the Traditional Children's Games course was taught by faculty members who had a physical education and sports undergraduate education. It is evaluated that the lack of adequate training of classroom teachers in physical education and game courses during their undergraduate education prevents the achievement of the objectives of the course, that problems arise due to the students not being physically and cognitively prepared for the next level of education, and that it does not seem possible to form a lifelong physical activity habit in individuals.

Keywords: Primary education, physical educatioan, physical activitiy, curriculum.

Reasons for participation in sports: A qualitative research on athletes with visual impairments

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Abstract: Sport is an important social phenomenon that improves the health of individuals in terms of physical and mental health, increases communication through the social environment, increases it, and provides motoric development. The reflection of the effect of sports on individuals with normal development on visually impaired athletes constitutes the starting point of this study. In this direction, the aim of this study: reveal the reasons why visually impaired athletes start sports, their motivation to continue sports and the changes created by sports in their lives. Phenomology design, one of the qualitative research methods, was used in the study. Thirteen visually impaired national athletes, 10 girls and 3 boys, aged between 19-32, who were interested in goalball and judo, who voluntarily agreed to participate in the study, participated in the study. In-depth interviews were conducted with the participants using a semi-structured interview form. Atlas.ti analysis program was used to analyze the data. In the analysis of the data, it is seen that there are sub-themes of discovery, curiosity and guidance in the theme of reasons for starting sports, desire to be successful in the motivation to continue sports, support, desire to have a fun career and desire to socialize, academic success, physical benefit, discovery, financial benefit, self-confidence and socialization in the theme of changes that sports bring to life. As a result, in the study, it is seen that the guidance of physical education teachers has an effect on the visually impaired athletes to start sports, the success achieved in continuing sports is effective, and the most important contribution to their lives is the development of their social aspects along with the increase in their self-confidence thanks to sports. In this context, it is recommended that visually impaired athletes should be supported to be brought into social life through sports.

Keywords: Visually impaired athletes, participation in sports, socialization.

Gender and age-related differences in flexibility among Albanian first and fourth graders (2013–2024)

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Abstract: This study investigates variations in flexibility levels across first and fourth-grade Albanian elementary school children from 2013 to 2024. A total of 240 children participated in the study, comprising 121 children in 2013 (89 first-graders and 32 fourth-graders) and 61 children in 2024 (32 first-graders and 29 fourth-graders). Flexibility was evaluated by the Sit and Reach test, and independent samples t-tests were performed to compare mean results throughout the two years. The results demonstrated a notable reduction in first-grade flexibility from 27.1 cm in 2013 to 23.2 cm in 2024 ($p = 0.005$), although fourth-grade flexibility exhibited no statistically significant variation ($p = 0.639$). Gender-based analysis indicated no notable changes in flexibility among first-grade males, whereas first-grade girls had a considerable enhancement ($p = 0.001$). Fourth-grade boys had a notable reduction in flexibility ($p = 0.036$), whereas fourth-grade girls displayed a considerable enhancement ($p = 0.042$). The data indicate a decrease in flexibility in younger children, maybe associated with diminished physical activity or lifestyle alterations. The observed gender disparities suggest that females exhibit higher involvement in activities that enhance flexibility, while boys' engagement in flexibility-related exercises may have diminished. Additional research is required to investigate the influence of physical education programs, extracurricular activities, and lifestyle choices on these trends.

Keywords: Flexibility, sit and reach, physical activity, gender differences, child health, Albania.

Exploring peer teaching and living the curriculum as experiential pedagogies in the first year of initial teacher education in the Luxembourgish context

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Abstract: One of the objectives of PETE programs is to provide pre–service teachers (PSTs) with content knowledge on "what" to teach and pedagogical knowledge on "how" to teach. Living the curriculum as pedagogy provides students with content knowledge with the possibility to use it in particular pedagogical settings (Deeninhan et al., 2017). Peer teaching is an effective pedagogy for learning how to teach, especially for professional behavior that is difficult to develop in a traditional classroom, and for the development of communication skills, self–reflection skills, and time management (Campolo et al, 2013). While experiential pedagogies are widely used in PE-ITE practice (McMillan & Jess, 2021), their use in the first semester of ITE is not a common practice. The presented paper explores practices and experiences related to the use of experiential pedagogies (peer–teaching and living the curriculum) in the first semester of PE courses within a generalist ITE program. It aims to investigate teacher educators' experiences and PSTs' learning experiences and to consider the benefits and challenges of using this approach at the beginning stages of ITE. The context of the study is a PE curriculum/planning course in a four–year Education Science program in Luxembourg. Fifty PSTs participated in the course. The authors were engaged as non-participant observers and interviewers, while the course was led by an experienced PE teacher educator. Data was collected through interviews with the teacher educator, teacher educator reflective diaries, and focus group interviews with PSTs. The paper gives insights into the teacher educator`s perspective on experiences and challenges that occurred while simultaneously leading students through "what" to teach and "how" to teach and students' perspectives of perceived learnings, difficulties, and challenges while being both in the position of students (living the curriculum) and teacher (peer-teaching) from the outset of their ITE program.

Keywords: Experiential pedagogies, teacher education, students' learning.

Exploring physical literacy promotion from childhood to adulthood in Serbia: Key agents, attitudes and actions

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Abstract: This project explored physical literacy (PL) perspectives in Serbia, focusing on two primary agents involved in the encouragement and facilitation of active lifestyles among children and adults, those being physical education (PE) teachers and personal fitness trainers (PT). Semi-structured interviews, guided by Grecic and Collins' (2013) Epistemological Chain, were conducted with experienced PE teachers (n=20), high-level PTs (n=12), and recent graduates from sport and PE universities (n=24) to understand their philosophies and awareness of PL. Reflective Thematic Analysis revealed varied interpretations of the PL concept across groups. Although PE teachers demonstrated solid understanding of PL, a term not widely recognised, they revealed a tendency toward discipline-focused, structured teaching, suggesting professional and organisational barriers that challenged their theoretical aspirations for holistic, student-centered pedagogy practices. High-level PTs, recognised for their exemplary work, reported an experiential shift from traditional, performance-focused training services towards a more holistic model incorporating psychosocial support for their clients, thereby fostering the concept of PL. The perspectives of university graduates highlighted that, despite increasingly holistic academic content within their degrees, they had not been provided enough opportunities to experience and implement these ideas in practice. In summary, all groups demonstrated positive attitudes towards PL, albeit with diverse understandings. Crucially, they identified significant educational gaps concerning interdisciplinary and inquiry-based learning. A common theme was the necessity for pragmatic PL promotion strategies to achieve its benefits. This project highlights the critical role of pupil-teacher and client-trainer dynamics, emphasising the need for enhanced professional development across professions concerning the work with children and adults in physical activity promotion. These insights are valuable for educators, fitness professionals, and policymakers, aiding in developing evidence-based strategies to combat sedentary trends and foster lifelong physical activity.

Keywords: Physical education, pedagogy, personal training, holistic, professional development.

Evaluating Physical Education Instruction Models in Primary Schools: A Project Overview

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Abstract: International organizations influencing development of Physical Education, including FIEPS, EUPEA, CEREPS, AIESEP, and UNESCO, have recently emphasized the importance of Quality Physical Education (PE) at all levels. While research emphasizes quality PE, comparative studies on teaching models in primary education are limited. This study aims to provide evidence-based recommendations for optimizing PE instruction in primary schools. This project, entitled "Tandem Teaching in Primary Physical Education and its Impact on Motor, Cognitive, and Affective Development," investigates the effectiveness of various PE instruction models in first to fourth-grade classrooms. These models include instruction by a generalist teacher, a PE specialist teacher, a sports coach, and different tandem teaching configurations (PE teacher and assistant teacher, generalist teacher and assistant teacher, and external sports coach and generalist teacher). Preliminary data from approximately 200 participants in first and third grade are currently being analyzed. Pupil physical fitness was assessed using the 20-meter shuttle run, pull-up hold, standing broad jump, and sit-and-reach tests. Basic motor competence was evaluated using the MOBAK test batteries. Self-reported physical literacy was measured using the PLAYSelf questionnaire. Additionally, an ad-hoc questionnaire was used to determine students' out-of-school physical activity levels. Data will be analyzed using statistical methods, including ANOVA and correlation analysis. We hypothesize that the results will demonstrate a significant improvement in motor skill development and physical fitness in students taught by PE specialists in tandem configurations. The results will provide insights into the impact of different instructional models on motor skills, physical fitness, and self-reported physical literacy in first to fourth-grade students. Data collection is currently underway. This study will contribute valuable insights into effective PE teaching practices at the primary school level, informing future research and educational policy. This project is supported by VEGA grant number 1/0127/23.

Keywords: Physical education, tandem teaching, physical literacy, primary education.

Application of the FitBack Toolkit for improving the physical literacy of students in physical education classes – Serbian teachers' experiences

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Abstract: The FitBack4Literacy project brings together 10 partner institutions across Europe, along with several associated international organizations, to expand the established FitBack network (www.fitbackeurope.eu formerly an Erasmus+ project) across the research, education, and sports sectors. One of the main objectives of the project is to evaluate the upgraded FitBack reporting system, which includes a novel, multilingual physical literacy toolkit. The toolkit is tested across nine European sites to assess its' feasibility and effectiveness in improving physical literacy (PL). This paper aims to present the experiences of physical education teachers in Serbia in using the FitBack toolkit (FT) during the project. Methods: An interventional study is being conducted across nine experimental countries: Slovenia, Croatia, Estonia, Italy, Serbia, Portugal, Spain, Finland, and Turkey. Twelve teachers in Serbia are involved in this study. Before the intervention, teachers completed questionnaires regarding their understanding of the PL concept. Among the teachers who understood the concept well, the teachers were randomly assigned to intervention or control group (six in each). Prior to using the FT in the school setting, teachers in the intervention group were familiarized with the FitBack network, its capabilities, and the new FT. The FT is specifically designed to empower PE teachers to highlight the integral role of physical fitness monitoring in developing students' PL.

Through the FT, a variety of engaging scenarios and corresponding topics centered on Physical Fitness, PL, The Power of Feedback, and Exercise are presented, enriched with dynamic and attention-grabbing animations. Conclusion: After six months of using the FT in teaching, teachers described their experiences in applying different scenarios with students via monthly reports. Their positive and negative experiences were analyzed and will inform potential adjustments to the latest version of the FT.

Keywords: Physical literacy, Physical fitness, School environments, Toolkit.

New Era in Sports Management Education in Turkey: Central Placement Decision

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Abstract: YÖK has decided to admit students with central placement for sports management departments on 03.12.2024. The central placement decision means that the student can directly apply the relevant department with the score obtained from the YKS (Higher Education Institutions Examination) without any special aptitude exam. The aim of this study is to analyze the reflections of the decision in the academic field by analyzing the opinions of academicians working as administrators in the sports management department regarding the central placement decision. Case study, one of the qualitative research designs, was adopted as the method of the study. Semi-structured interview technique was used as the data collection method and interviews were conducted with 8 academicians working as administrators in the sports management department of various universities. Both content and descriptive analysis were used together in the analysis of the data. Criterion sampling method, one of the purposeful sampling methods, was used in the study. Among the findings obtained from the research; it was found that the administrators in the sport management department were not included in the process of making decision and that they were informed about this decision by the letter sent by YÖK to the universities, that the central placement decision would have negative consequences for the sport management department and that it will not match up with the curriculum of the department. In addition, it was also stated that special aptitude exam should be applied as the most appropriate student recruitment method for the sport management department. As a result, either the central placement decision should be revised or the course contents and applied education should be updated in order to support the academic and professional development of students who get into universities through central placement.

Keywords: Central placement, sport management, special aptitude exam.

Preservation of national values for future generations: The importance of Azerbaijani national wrestling in physical education

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Abstract: Physical education (PE) is important for maintaining students' physical and psychological health. It is important to note that preserving and promoting national culture and sports traditions should also be a focus in the educational process. The sports taught within the PE curriculum in schools vary based on the standards and policies of each country's education system. Teenagers in some countries, most notably in Azerbaijan, have been observed to lack adequate knowledge of and interest in national sports. This study analysed the role of national wrestling in PE in schools and its possible contributions to students' overall development. As part of the study, the literature review method was used to determine the importance of implementing national wrestling elements into PE and to identify its potential benefits. The results obtained from the literature analysis indicate that integrating national sports into school programs positively influences students' physical, psychological, and social development. In addition to improving students' physical abilities, Azerbaijani national wrestling (gulash) helps them develop self-control, accountability, and teamwork. This sport is also important for transmitting cultural heritage and maintaining national identity. Experiences from other countries show that integrating national sports into the curriculum reduces stress and depression levels, improves social interactions, increases motivation and interest in sports. Therefore, it would be beneficial to include national sports, particularly gulash, in Azerbaijani schools' curricula. As a result of the study, it can be concluded that integration of national wrestling into the PE curriculum may positively influence students' development of athletic abilities, preservation of national values, and their transmission to future generations. Nevertheless, it has been noted that there is a lack of scientific research on this subject. Future research should consider adopting experimental approaches and developing methods to facilitate broader integration of national sports into schools' curricula.

Keywords: Physical education, gulash, national sports, national value.

Monitoring physical fitness to enhance the development of physical literacy in children and adolescents - Estonian example

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Abstract: Estonian government accepted the new physical education (PE) curriculum in 2023. This is based strongly on the physical literacy concept and includes the outcome area of Health and Fitness. There is a strong recommendation for PE teachers to use health-related physical fitness tests based on the FitBackEurope platform. Many schools have started using it and have included the tests and feedback report as a part of the PE school curriculum. Five teachers (3 women and 2 men) from three different schools (1 basic, 1 upper secondary school, 1 school where basic and upper secondary schools are together) piloted the physical fitness and literacy toolkit from the FitBackEurope platform during one study year. This toolkit was designed to empower PE teachers to support pupils in their physical fitness/literacy journey. The feedback from the teachers about the platform and toolkit were collected through focus group interviews. 365 pupils from grades 5 – 12 were involved with the project. All teachers liked physical fitness tests and the possibility for pupils to do reports and get health-related feedback. Teachers watched all the videos and used them during the teaching process. They reflected that they got new knowledge from the videos and had an idea how to use these concepts in various situations also during the health education subject. The general opinion was that the pupils liked testing and getting feedback, as well as the PDF material with tips on how to improve fitness. The upper secondary school teacher said that in this age group, pupils already search for deeper knowledge about fitness, and they didn´t feel a strong relationship with the animated videos. On the other hand, basic schoolteacher stressed the reasonable length of the videos, and that the fitness topic covered the important factors well.

Keywords: Physical fitness testing, fitback europe, toolkit for physical literacy and physical fitness.

The role of different warm-ups depending on the proposed training theme before a youth football tournament

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Abstract: Soccer coaches, fitness professionals soccer and athletic trainers have long believed and taught that would have kept them out of the doctor's office. Are they right? Researchers recently began to examine how muscles respond to stretching and how this relates to exercise performance and injury risk. Many study that found reaction time, movement time and balance were all reduced after 20 minutes of standard stretching before exercise. At the elite levels, even the smallest reductions in these important variables could have a significant effect on soccer players stretching before training is vital; hence, many players are filled with guilt and regret, believing that more frequent stretching, especially given the differences in muscle growth at the age of 16 years .Their findings suggest it may be time to update the old rules about stretching. And then this article just want to emphasize that if a suitable heating program resolves the problem when an appropriate muscle stretching workout day and again will help streengthen muscle flexibility.

Keywords: Plan-program stretching, soccer training, risk of injuries, tournament type competition.

Comparison of grip strength results in children aged 11-13 years

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Abstract: The primary aim of this study is to determine the correlation between the results obtained using two different measurement instruments (the Takei dynamometer and the Jamar dynamometer) for assessing grip strength. The secondary goal is to compare the results of children aged 11-13 years with different athletic backgrounds. The findings could highlight the issue of muscle hypotonia in children who are not engaged in sports, compared to those who are. The study involved 228 participants, who were divided into two groups: 144 children who engage in sports and 84 children who do not. Both groups were tested for grip strength using two different instruments. Grip strength was measured using the Takei and Jamar dynamometers with both the dominant and non-dominant hands. The results from the Takei dynamometer for athletes showed an average of 22.7 kg ± 4.70, while non-athletes achieved an average of 18 kg ± 3.58. The Jamar dynamometer results for the right hand showed an average of 21.6 kg ± 4.79 for athletes, and 16.4 kg ± 3.40 for non-athletes. Statistical analysis revealed a significant correlation between the two measurement instruments ($r = .800$; $p < 0.001$). As for the comparison between athletes and non-athletes, the findings provide insight into the current state of children. The results suggest that children who are not involved in sports should be encouraged to participate in physical activities, as this will contribute to their growth and development, while children already engaged in sports should continue to develop their motor skills. Future studies could benefit from testing children from different regions of Croatia. Such research could reveal whether there are more positive trends in other parts of the Croatia.

Keywords: Children, motor skills, static strength, athletes, non-athletes.

Can muscular fitness components predict cardiorespiratory endurance of elementary school students?

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Abstract: Cardiorespiratory fitness is defined as the body's ability to perform moderate to high-intensity activities of prolonged duration, which, together with components of muscular fitness, positively influences the cardiorespiratory profile of children and it's an important predictor of physical and mental health in youth. The aim of this study was to determine the predictive significance of coordination, agility, explosive strength, flexibility, and repetitive strength tests on the cardiorespiratory fitness of boys and girls in elementary school. The study involved 4,256 girls and 5478 boys aged 10 to 14 years, and measurements were conducted within the framework of the CRO-FIT project during the 2008/2009 school year. The sample of variables included 4 measures for assessing morphological characteristics, 15 tests for evaluating muscular fitness, and a 600-meter running test for girls and an 800-meter running test for boys. The results showed that the tests Backward polygon, Side steps, Narrow split forward bend, and Medicine ball throw from lying position were statistically significant predictors of cardiorespiratory fitness measured by the 600-meter running test for girls. However, the results of motor skill tests for boys did not show a statistically significant correlation with the 800-meter running test. These results can show direction in programming of physical education classes to enhance cardiorespiratory endurance by improving components of muscular fitness in girls and aiming boys towards extracurricular activities.

Keywords: Cardiorespiratory fitness, children, school, physical education.

From assessment to empowerment: The FitBack toolkit's role in enhancing physical literacy

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Abstract: The multilingual FitBack platform offers a valuable resource for monitoring student physical fitness. However, varying teacher competencies often hinder the effective implementation of fitness testing, potentially leading to student stigmatization. To address this, the FitBack network developed an educational toolkit designed to enhance teacher proficiency in this area. Methods: A systematic, multi-stage methodology was employed, including: (1) collaborative brainstorming to define toolkit content and features; (2) development of scenario-based learning modules supported by relevant topics; (3) creation of the toolkit's technical structure and visualization; (4) pilot testing of the logic and visual design with teachers; (5) scriptwriting and selection of scenarios; (6) production of engaging video animations and accompanying text descriptions; (7) technical implementation and iterative refinement of the toolkit prototype; (8) translation of animation subtitles; and (9) public launch of the toolkit. Results: The digital FitBack toolkit, accessible on the FitBack platform (www.fitbackeurope.eu), comprises 11 scenarios and 22 supporting topics organized into four chapters: Physical Fitness, Physical Literacy, The Power of Feedback, and Exercise. Each module follows a consistent structure, including a concise introduction, engaging animation, short text explanation, relevant references, and links to related toolkit content. Conclusion: A small-scale intervention study is currently underway across 10 European countries to evaluate the effectiveness and usability of the FitBack toolkit among teachers. This study will provide critical insights into the toolkit's usability and impact on teacher competencies.

Keywords: Physical fitness, physical literacy, toolkit, competency.

The scientific background of the FitBack platform

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Abstract: The FitBack network, encompassing 31 partner institutions across 26 countries (primarily European) and collaborating with international organizations, aims to promote physical fitness monitoring to enhance physical literacy in children and adolescents. This contribution details the scientific foundation underpinning the FitBack network's development of comprehensive, evidence-based fitness reports. Methods: The development of European fitness norms, integrated into FitBack individual reports for peer comparison, was based on the analysis of over 8 million fitness data points. A systematic literature review was conducted to establish the link between childhood fitness scores and long-term health outcomes. Where gaps existed in age-specific findings, rigorous methodologies were employed to establish health risk cut-off points, which were subsequently incorporated into FitBack reports. Teacher evaluations of the reports were also collected. Results: The FitBack reports provide evidence-based feedback on fitness assessments, enabling the comparison of individual fitness levels against European norms and highlighting potential health risks. This facilitates the establishment of standardized fitness monitoring systems across Europe. Conclusion: While the FitBack reports offer a robust framework for fitness monitoring, effective implementation relies on targeted teacher education to enhance their competencies in utilizing fitness monitoring to promote physical literacy among students.

Keywords: Physical fitness, physical literacy, monitoring, assessment.

Assessment of physical fitness of the national wrestling athletes through the functional tests

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Abstract: The importance of functional tests lies in their ability to assess the overall physical condition of athletes. The primary indicator of an athlete's functional state is their general physical work capacity, which reflects the body's readiness to perform physical work. This depends on the activity of the cardiovascular system. The aim of this study was to assess the physical work capacity of national wrestling athletes through functional tests. The physical fitness of athletes was evaluated using the Harvard Step Test (PWC170). The test consisted of two stages of physical exertion, with heart rates not exceeding 130 beats per minute after the first load, and 170 beats per minute after the second. The level of physical load was adjusted by varying the climbing and descending speed of the stairs. Data showed that out of 25 tested athletes, 4 scored between 61-70, indicating adequate physical activity; 7 scored between 71-80, indicating good fitness; 10 scored between 81-90, showing a very good level; and 4 had scores above 90, indicating excellent physical activity. The average PWC170 speed was 1588 ± 21.0 kgm/min. The results suggest that while national wrestling training emphasizes strength (anaerobic) training, there is a need to focus more on endurance (aerobic) training

Keywords: Physical fitness, functional tests, Harvard Step Test, wrestling, aerobic training.

Intrinsic and extrinsic factors in success and failure: A study on elite trampoline athletes

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Abstract: Attribution theory suggests that individuals use the distinction between internal and external factors to determine the causes of events. Extrinsic attributions refer to the explanation of a behavior by environmental factors, while intrinsic attributions focus on an individual's personal characteristics or abilities. However, it is thought that revealing the success and failure perceptions of athletes will be an important factor in the continuation of their success and elimination of the causes of failure. Accordingly, the aim of this study is to examine the reasons for success and failure in elite trampolinists. It is important to reveal the perceptions of success and failure in order to maintain the success of the athletes and to eliminate the factors of failure. Weiner's attribution theory constitutes the theoretical framework of the study. Phenomenology design, one of the qualitative research methods, was used in the study. Purposive sampling method was used to determine the study group. The study group of the research consists of 10 active national trampolin athletes, 3 women and 7 men from 8 different countries, who participated in the European Championship, World Championship and Olympic Games. The participants' views on the reasons for success and failure were obtained through in-depth interviews using a semi-structured interview form. Atlas.ti analysis program was used to analyze the data. In the study, it is seen that the reasons attributed to success and failure consist of two sub-themes as internal and external factors in accordance with the attribution theory. However, when the participant views on success and failure are evaluated, it is seen that the concept of effort, which is an intrinsic factor in both success and failure, comes to the fore.

Keywords: Reasons for success and failure, attribution theory, elite trampoline athletes.

Specificities of metabolic and cardiovascular response as a function of performance in a specific wrestling test

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Abstract: In addition to technical-tactical training, success in wrestling largely depends on physical preparation. Therefore, special attention should be paid to the metabolic and cardiovascular system and their specificities in the diagnosis of wrestlers. The subject of this paper is the success on the Specific Wrestling Performance Test and the accompanying responses of the organism. The aim of the work is to examine the differences and specificities of the metabolic and cardiovascular response of wrestlers as a function of success. The sample consists of 64 wrestlers, divided into three groups of success (low:≤34;medium:35-44;high:≥45 throws), and subgroups in the function of lactate displacements (La↓andLa↑), and in the function of cardiovascular recovery (ΔHR1min≤9.99% and ΔHR1min≥10%). In order to relativize the load, three wrestling dummy were used, and the suplex as a standard throw. As a function of success groups, we can conclude that statistically significant differences were established, in the number of throws as expected (p=0.000), and exclusively in the achieved absolute and relative values of HR the second minute of recovery (p=0.005). When we compared the La↓ and La↑ subgroups within the success groups, we observed differences only in the absolute and relative values of the change in La between measurements, both in the low group and in the medium group, where a difference in the number of throws was also found. By comparing the defined subgroups ΔHR1min≤9.99% and ΔHR1min≥10% within the success groups, differences in absolute and relative HR values were determined regardless of the level of success, and differences in the metabolic level within the low and high groups.

It can be concluded that the metabolic and cardiovascular reaction definitely affects performance, but that the way of recovery of the mentioned systems represents the individual response of each individual and cannot guarantee success, but can and should be improved individually.

Keywords: Combat sports, field testing, performance, lactate concentration, heart rate.

Assessing graduate satisfaction: Improving the physical education teacher training program

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Abstract: Understanding graduates' satisfaction with their education program is essential for enhancing learning experiences. Monitoring satisfaction levels among educational service consumers allows for continuous improvement of the educational process and fosters effective collaboration among all stakeholders in higher and professional education. The relevance of this study is underscored by the growing involvement of graduates in the educational process. Beyond faculty and administration, graduates—who are key stakeholders—actively contribute to the enhancement of higher education institutions. This study gathered data through an online survey conducted with a sample of three cohorts of graduates from the Physical Education and Sports Teacher Training program. Overall, respondents expressed satisfaction with the curriculum, instruction, support services, and sports facilities provided by the university. However, despite the positive feedback, the survey also highlighted areas for improvement, such as assessment methods for practical disciplines and the need for a greater number of elective courses. Based on these findings, further refinements to the program are necessary to better meet the needs of future graduates.

Keywords: Quality education, teaching and learning, teacher of physical education.

Perceived barriers to movement education among Turksih preschool teachers: Examining the ımpact of gender, school type and location

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Abstract: Movement education in early childhood plays a crucial role in developing fundamental motor skills and promoting lifelong physical activity. Preschool teachers are key facilitators of this process, yet various challenges may impact their effectiveness. This study examines preschool teachers' perceived barriers in teaching movement education and how these perceptions vary by gender, school type, and location. The sample included 204 preschool teachers (14 male, 190 female) from 25 provinces in Turkey, with educational backgrounds ranging from associate degrees (5.4%) to bachelor's degrees (82.4%) and master's degrees (12.3%). Their ages ranged from 21 to 50 years (M = 32.19), with an average of 9.2 years of teaching experience. Among them, 177 worked in public schools and 27 in private schools, with an average class size of 13.4 students. Additionally, 47 teachers worked in provincial centers, 93 in district centers, and 64 in village schools. Data were collected using the " Perceived Barriesrs to Teaching Movement and Physical Activity Scale" (Sofo & Asola, 2015), adapted into Turkish by Yapar & Yalçınkaya (2022). This 11-item, 5-point Likert scale assesses perceived barrires, with higher scores indicating greater challenges (Cronbach's α = .738). Results showed that teachers generally perceive low level of barriers (M = 2.04), with the most significant challenge being a lack of peer support (M = 3.20). No significant differences were found based on gender (p = 0.682), school type (p = 0.237), or location (p = 0.147). In conclusion, preschool teachers report low perceived barriers to movement education, regardless of demographic factors. Enhancing peer support may further improve movement education practices.

Keywords: Movement education, preschool teachers, perceived barriers.

Investigation of youth soccer coaches teaching behaviors

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Abstract: The purpose was the investigation of teaching behaviors of soccer coaches in U14 age group by using systematic observation. Participants consist of 4 male soccer coaches who coaching U14 youth soccer context. Coaches mean ages were 31.7 and they have 8.4 years coaching experiences on average. Each coach does coaching for the different youth soccer team. Non-Participant observation technique was used as data collection method. During the 6-week period, each coaches' training sessions were recorded 3 times and total 12 training were recorded as video. The obtained data were analyzed using Arizona State University Observation Instrument (ASUOI) that was developed by Lacy ve Darts (1989) and adapted Turkish by Yapar (2016). 12 recorded training videos were analyzed by using ASUOU categories with 10-second intervals to investigate coaches' behaviors. Observed coaching behaviors coded and determined in which behavior groups the coaching behaviors clustered as numerical and percentages. As a result 6432 coaching behaviors were observed in 1072 min training video record. When the distribution of coaching behaviors was analyzed according to ASOUI categories; 3683 instructional behaviors (57,26%) (Pre-instruction 1293, Concurrent instruction 913, Post-instruction 536, Questioning 376, Physical assistance 75, Positive modeling 408, Negative modeling 82); 723 Supportive and Encouraging Behaviors (11,23%) (Hustle 456, Praise 162 and Scold 105); and 2026 Non-Teaching behaviors (31,51%) (Management 1161, Silence 573 and Uncodable behaviors 292). In conclusion, The most commonly used behaviors of youth soccer coaches in U14 teams were instructional behaviors, Non-Teaching behaviors and Supportive and Encouraging Behaviors followed the instructional behaviors.

Keywords: Coach behavior, youth soccer, systematic observation.

Motivational characteristics of students participating in non-formal education and their relationship with age and sports achievements

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Abstract: Motivation is a fundamental factor influencing athletes' ability to set goals and overcome challenges (O'Neil & Hodge, 2020). It can be categorized as intrinsic, where an activity is inherently enjoyable, or extrinsic, where motivation is driven by external rewards (Ryan & Deci, 2000). The motivational environment, along with the role of coaches, significantly impacts students' psychological needs and behavioral changes. While the pressure to win can sometimes result in frustration and decreased motivation, the evolving field of sports science necessitates continued exploration of motivational characteristics (Liang et al., 2025). This study aimed to investigate the motivational characteristics of students engaged in non-formal sports education, considering variables such as age, gender, and sporting experience. The study involved 112 adolescents (52% males, 48% females) with a mean age of 17,54 ± 1,49 years. The Sport Motivation Scale (Pelletier et al., 1995), validated in Lithuania (Grajauskas, 2008), was used to assess intrinsic motivation, extrinsic motivation, and amotivation. The results indicated that boys exhibited significantly higher intrinsic motivation for self-improvement ($p<0,05$), whereas girls demonstrated stronger extrinsic motivation, particularly in introjected regulation and external regulation ($p<0,05$). Younger adolescents displayed higher intrinsic motivation, whereas older adolescents relied more on extrinsic motivation, though these differences were not statistically significant. Athletes with 6-8 years of experience exhibited the highest levels of both intrinsic and extrinsic motivation, but again, the differences were not statistically significant. No significant correlations were found between age, athletic performance, and motivation levels, although older adolescents tended to achieve better results. Strong correlations were observed between intrinsic and extrinsic motivation, while amotivation showed a notable correlation with extrinsic motivation, suggesting that heightened exposure to external incentives may be linked to reduced motivation. These findings highlight the importance of considering gender, age, and individual motivational characteristics in coaching practices.

Keywords: Intrinsic motivation, extrinsic motivation, non-formal education, sport achievements, adolescents.

The effect of physical education and sports course value and self-esteem on well-being in high school students

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Abstract: The aim of this study is to examine the effect of the value attributed to physical education and sports courses and self-esteem on well-being in high school students. This study employs a correlational survey model, one of the quantitative research approaches. The participants consist of 660 high school students enrolled in public schools in Ankara during the 2024-2025 academic year. Data were collected using a demographic information form prepared by the researchers, along with the High School Physical Education and Sports Course Value Scale to assess the value attributed to physical education and sports courses, the Rosenberg Self-Esteem Scale to measure self-esteem, and the EPOCH Well-Being Scale to evaluate well-being. Descriptive statistical analyses were conducted, and the normality of the data distribution was assessed based on skewness and kurtosis values, confirming a normal distribution. Pearson correlation analysis was used to examine the relationships among variables, while multiple linear regression analysis was employed to assess the impact of independent variables on the dependent variable. The findings indicate that the value attributed to physical education and sports courses and self-esteem collectively explain 29.9% of the variance in well-being (R^2 = .299). Furthermore, a significant positive relationship was found between the value attributed to physical education and sports courses and well-being, whereas a significant negative relationship was identified between self-esteem and well-being. In conclusion, it can be stated that valuing physical education and sports courses enhances psychological well-being, while self-esteem has an inverse effect.

Keywords: Physical education, value, self-esteem, well-being.

The effect of family harmony on academic grit in university students

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Abstract: It can be argued that family harmony is a significant determinant of an individual's psychosocial development, particularly in terms of grit and determination exhibited in academic life. In this context, the present study aims to determine the effect of family harmony on the academic grit of university students and to examine whether various variables effect family harmony and academic grit differently. The study included 268 participants studying at faculties of sports sciences, and data were collected through a personal information form, the "Family Harmony Scale," and the "Academic Grit Scale." In the data analysis, descriptive statistics were used, and since homogeneity of variance was met, independent samples t-tests, one-way ANOVA, post hoc tests, Pearson correlation, and regression analyses were performed. The internal consistency coefficients for the present study were found to be .93 for Family Harmony and .95 for Academic Grit. Findings revealed that participants exhibited high levels of family harmony and above-average academic grit. Family harmony and academic grit scores differed based on gender, perceived income, and academic grade point average, whereas no significant differences were found regarding year of study and department. Additionally, a significant positive correlation was observed between family harmony and academic grit, and family harmony was identified as a predictor of academic grit. In conclusion, the findings suggest that family harmony significantly influences the academic grit levels of university students and serves as an important resource in achieving their academic goals.

Keywords: Family harmony, academic grit, university students.

Anthropometric characteristics and physical development of track and field athletes: A morphological and functional analysis

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Abstract: The purpose of this study is to determine and evaluate anthropometric indicators characterizing the physical development and body structure of track and field athletes. The study involved 10 first-category track and field athletes aged 19–20 years from the Turkmen State Institute of Physical Education and Sports. Standard anthropometric instruments, including Martin anthropometer, measuring tape, electronic scales, and hand dynamometer, were utilized to assess various body parameters. The results indicated that the athletes' anthropometric characteristics align with the dolichomorphic somatotype, characterized by long limbs and well-balanced body proportions. The findings highlight the importance of anthropometric assessments in athlete selection and training optimization. The study concludes that the evaluated physical development indicators conform to sports medicine recommendations and can be applied to enhance athletic performance and prevent injuries.

Keywords: Track and field, anthropometry, physical development, sports performance, morphological characteristics.

The effect of walking on akhalteke horses on the recovery of athlete's training fatigue

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Abstract: This study investigates how walking on Akhalteke horses can assist in the recovery of athletes' physical fatigue and psychological tension. Athletes in high-intensity training often accumulate residual fatigue, and existing recovery methods do not fully address this issue. The research explores walking on Akhalteke horses as a potential solution, improving lactate levels, heart rate recovery, and psychological tension. Results show significant improvements, suggesting that this method may offer a comprehensive recovery strategy. Athletes' success is closely tied to the effectiveness of their training sessions. High-intensity training often leaves athletes with residual fatigue that does not fully recover by the next session, hindering performance. This study explores the potential of walking on Akhalteke horses as a novel recovery method, aiming to balance the physical and psychological demands of intense training. Despite various recovery methods, the specific impact of walking on Akhalteke horses remains underexplored.

Keywords: Akhalteke horses, athlete recovery, fatigue, psychological tension, sports training, lactate levels.

Perceived changes in quality physical education: impact of specialized physical education teachers on childhood and primary education trainee

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Abstract: Law No. 234 of December 30, 2021, Article 1, paragraphs 329-337, introduced specialized physical education teachers in the fifth grade (2022/23 academic year) and fourth grade (from 2023/24 academic year) of primary schools in Italy. This study aims to assess perceived changes in the quality of physical education as reported by Childhood and Primary Teachers Education students at the University of Turin during their internships in general primary school classrooms, following the law's implementation. The sample included 156 students in the fourth year of the Childhood and Primary Teachers Education program at the University of Turin in the 2021/22 academic year (group A) and 145 students in the 2022/23 academic year (group B). Participants completed an adapted version of the UNESCO's Worldwide Survey of Quality Physical Education (QPE), Fourth Edition (2020). Data analysis revealed a slight increase in weekly physical activity time (one hour or less: -7.7%, two or more hours: +5.7%), a positive shift in the perception of physical education's evaluation, considering it on par with other subjects in terms of academic grading (+13.5%), and improved inclusion of students with special educational needs (+11.6%). Key challenges identified across both groups included limited prior training in physical education and the ongoing involvement of external experts (sports instructors, coaches) in delivering the discipline.

Keywords: Quality physical education, teacher education, physical education in elementary education.

Enhancing bodily awareness in preservice teachers through analogic and digital heart rate monitoring for better physical activity promotion in primary schools

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Abstract: Background: The importance of physical activity (PA) improving health and well-being is widely acknowledged. PA rates are declining, and efforts to promote active lifestyles in schools (ALS) depend heavily on the competence and motivation of teachers (Pellegrini, 2008). Teachers with higher levels of physical literacy (PL) are more likely to engage students in PA (Durden-Myers, Green, & Whitehead, 2018). Preservice teachers (PT) lack awareness of physiological responses to exercise, limits their to promote PA activity (Kwan, Welk, Chen, 20). This study aimed to understand the level of bodily awareness in PT by engaged in two physical tests, compared analogic and digital heart rate (HR) monitoring, exploring ability to self-monitor physiological responses and role in health promotion (Sun, Li, & Shen, 2017). Methods: A total of 171 preservice teachers (mean age = 24.7 ± 5.4 years; weight = 60.3 ± 11.4 kg; height = 164.2 ± 17.5 cm; BMI = 21.6 ± 4.8). Tests was 6MWT and T-test . Heart rate recorded analogic (carotid pulse count) and digital (heart rate digital-app). Results: Analysis revealed significant discrepancies between analogic and digital HR in both tests. In 6MWT, HR recorded via carotid palpation differed significantly from that recorded digitally ($p < .001$). Similarly, in agility Ttest, the HR values obtained with the two methods showed a significant difference ($p < .001$). Findings highlight a limited participants competence for accurate self-assessment, underscoring a gap in their bodily awareness. Conclusion: The results suggest that PT nounderstand physiological responses during PA. This limitation can limited ALS promotion. Future research should include a comparison with a trained sample to understand the impact of physiological awareness and promoting ALS. Study is ecological validity by school based settings. The untrained-unconfident teachers and promotion PA gap to suggest bodily awareness-physiological education integration in preservice teacher training programs and university curricula.

Keywords: Physical education preservice education, body awareness, heart rate monitoring, analogic-digital, physical activity promotion.

Health-promoting Universities in Italy: Exploring physical activity, lifestyles, and well-being in higher education

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Abstract: The present research aims to describe preliminary results of "Universities Promoting Health" study, across 15 University Sports Centers (USC) in Italy during 2022–2023. The study aimed to promote physical activities beyond traditional sports and to evaluate the physical activity levels and fitness of university students not regularly engaged in sports. A total of 1,065 students participated (597 males, 468 females; average age ~22 years). The activities offered included expressive movement, yoga, Pilates, trekking, parkour, aerobic gymnastics, cardio fitness, and walking groups. These programs were designed to encourage daily movement and expand the educational offerings of the centers. Participants included both students already enrolled in USC activities and sedentary students. The effectiveness of these interventions was assessed at two different time points (t0 vs. t1) to evaluate improvements in physical activity and health. The results provided preliminary and essential information for the various centers to design, implement, and evaluate interventions and new types of activities to be offered to university students, in addition to the traditional specific sports courses. This aligns with various studies suggesting the necessity of regular and systematic monitoring of health indicators, physical activity levels, and motor development across different age groups. The collected data highlighted, across all centers, the need to continue, expand, and further develop the initiatives undertaken so far, aimed at promoting a culture of daily physical activity first, followed by sports practice. The findings reveal physical activity levels that, regardless of gender differences, do not fully meet WHO Recommendations and Guidelines. The project offers valuable insights into the benefits of structured physical activity in university settings, highlighting the need for a socio-cultural approach to health promotion, encouraging daily physical activity as a foundation, and supporting future policies by educational and health institutions aimed at combating sedentary behavior and fostering lifelong healthy habits.

Keywords: Physical activity, healthy lifestyles, physical fitness, health-promoting universities.

Examination of the concepts in the context of free time and physical activity in the curriculum teaching programs

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Abstract: While the concepts of leisure time and physical activity are gaining value day by day, curricula have an important role in the dissemination and development of these concepts in society. Therefore, it has become an issue that needs to be evaluated what kind of content the pre-school, primary school, middle school and high school curricula, which are defined as Maarif Model by the Ministry of National Education and have recently undergone a comprehensive change, offer to students. In this context, the aim of this study is to examine the concepts in the context of leisure time and physical activity in the content of the curricula that have been gradually implemented since the 2024-2025 academic year. The concepts in the research were determined as: sport, sportive, recreation, game, activity, lessons activity, talent, entertainment, leisure, free time, leisure time, race, trip, organization, physical activity, physical health and physical education. In the study, the document analysis technique from the qualitative research method was used and the frequency and context in which the concepts were used in the content of the curricula were determined by content analysis. According to the results of the data analysis, it was concluded that the concepts identified in the research were used in the context of leisure time and physical activity, and that they were partially used outside their meanings.

Keywords: Leisure time, physical activity, circullum, physical education, educational programs.

The influence of body composition on handgrip strength in young athletes

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Abstract: Abstract The purpose of this study is to examine the impact of body composition parameters on handgrip strength in young athletes aged 11 to 15 years. Handgrip strength was assessed using a dynamometer, while body composition was measured with three different devices: InBody, Omron, and Tanita. Key body composition metrics, such as skeletal muscle mass, body fat percentage, body mass index, and segmental muscle distribution, are crucial in determining strength capacity. The results demonstrate a strong positive correlation between muscle mass and handgrip strength, with players possessing greater muscle mass exhibiting superior grip strength performance. Conversely, a higher body fat percentage negatively influences handgrip strength due to an unfavorable mass-to-muscle ratio. Additionally, muscle distribution between the upper and lower extremities may play a role in force generation during the handgrip test. The findings highlight the necessity of systematic body composition assessment in young athletes to enhance strength training strategies and maximize performance outcomes.

Keywords: Body composition, muscle mass, body fat percentage, handgrip strength, young athletes.

Investigation of university students' views on recreational sports and factors affecting their participation in recreational sports

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Abstract: The main purpose of this study is to examine university students' views on recreational sports and their views on the factors affecting their participation in recreational sports. In line with this purpose, 10 students studying at Çanakkale Onsekiz Mart University Ayvacık Vocational School Sports Management Department voluntarily participated in the research, which was carried out using the semi-structured interview method. In this context, percentage frequency analyses were applied to the data obtained from the students. As a result of the analyzes, it has been determined that the majority of university students participate in recreational sports based on psychological benefits such as mental relaxation, coping with stress and improving mood, while technological tools such as digital fitness applications and online sports lessons are among the important factors that increase students' participation in sports. In addition to all these, when the suggestions submitted by university students to increase their participation in recreational sports were examined, it was determined that the majority of the students expressed their opinions that the social activities offered within the university could be increased and awareness programs for the academic and psychological benefits of sports could be organized for students in the field of sports

Keywords: Recreation, sports, leisure.

The invisible physical literacy in North Macedonia physical education

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Abstract: Physical literacy, as a holistic concept encompassing motivation, confidence, physical competence, knowledge, and understanding necessary for lifelong engagement in physical activity, has gained increasing recognition in global physical education (PE) frameworks. However, its explicit integration into national curricula varies. In North Macedonia, the term "physical literacy" is neither explicitly present nor widely recognized in the national PE curriculum. Despite this, many of its core principles are already embedded within the curriculum’s goals and expected competencies from learning. This study examines the presence of physical literacy principles within the national PE curriculum of North Macedonia and explores how PE teachers interpret and implement these ideas in practice, despite the term itself not being widely used. Desk analysis of the national PE curriculum for primary and secondary schools was conducted to identify elements of physical literacy within the stated goals, activities, and standards. Additionally, semi-structured interviews with 12 PE teachers (7 primary and 5 secondary) were thematically analyzed to assess their understanding of the concept and its application in their teaching. Findings indicate that while most teachers are unfamiliar with the term "physical literacy," many naturally incorporate its core elements into their practice. Teachers reported prioritizing student needs and interests, particularly in secondary education, where there is a clear mismatch between curriculum content and student preferences. They emphasized fostering enjoyment, teaching movement competence, and encouraging independent participation in physical activity beyond school. Their teaching philosophies centered on inspiring lifelong engagement in physical activity by adapting content, modeling active lifestyles, and supporting students in developing confidence and autonomy in movement. These insights highlight the implicit presence of PL principles in PE in North Macedonia. Making the concept more explicit in teacher education and curriculum design could strengthen its impact, ensuring a more structured and intentional approach to developing lifelong physical engagement among students.

Keywords: Physical literacy, PE curriculum, teacher perceptions.

Inspiring excellence: Empowering the future of physical and sport education

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Abstract: Lilit Mkrtchyan, Faculty of Health Technologies, Sport Tourism and Management, Armenian State Institute of Physical Culture and Sport, Yerevan, Armenia Sport is a type of human activity which provides numerous physical, mental, social, and cultural benefits that make them an integral part of life for many people around the world. Sports hold significant importance for physical health, mental well-being, social cohesion, economic contributions, and personal development, enhancing the quality of life for individuals and communities alike. Over time, sports have become more accessible, engaging, and globally recognized. There are some points which are important for the future of physical and sports education, such as popularization of sports, increasing athlete's level of self-awareness, government support, provision of necessary sports equipment, creating a professional dream team, using active propaganda through the media, promoting the relevant sports by region, etc. Of course these all are important, but education starts since childhood. The fundamental method of teaching sport education is game. Through a game we can train children not only to physical activities such as motor abilities, healthy lifestyle, etc., but to important values that the offspring can carry throughout their life. The Olympic definition is "To promote the development of physical and spiritual values, which are the basis of sport, to educate the younger generation through sport, mutual understanding and friendship, which will contribute to creating a better and safer world, and to promote goodwill between nations through the international dissemination of the Olympic principles." Sport is absolutely impossible without the rule of equality. One of the principles of peace in Olympic sports is equality: the rules are equal for everyone. Participation in sports helps individuals develop essential life skills such as discipline, leadership, time management, and goal-setting. These skills can be beneficial in personal and professional life.

Keywords: Sport, olympism, games, equality, coaches.

Team practices and coaching behaviours in professional women's soccer players: 7-day microcycle reporting in midseason

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Abstract: Clarifying the activities of athletes and coaches during the field is a prerequisite for understanding where things exactly stand and what can be done in the future. This study aims to examine the team practices of the first-division football club players and the behaviour of the UEFA B-licensed coach during a microcycle. Following the training sessions and gameplay recorded with a digital video camera (GoPro Hero Black 11®) connected to a chest-mounted microphone (DJI Mic 2®), players' activities, active times as well as the duration, frequency and timing of certain coaches behaviours were identified. A total of 32,464 seconds were analysed and intra-observer reliability was determined in the study. Training sessions are predominantly organised in training form (61.6%), while playful activities (15.4%) occupy even a shorter duration compared to inactive-transitional periods (22.8%). The coach talks approximately four times per minute in both training sessions and games, primarily providing team-orientated instructions in training while employing a more balanced strategy during a game. Notably, the coach provides three times more instructions during practice than the passive period of them (192&64 times), unlike studies that recommend avoiding interference during movement, which can disrupt the execution of the movement. The stereotypical training pattern that drill activities are preferred over playful ones is also seen in professional women's soccer players, along with coaches still getting too involved in the learning process, which may be an indicator of overcoaching, whose benefits are unclear. The next step would be to understand why! rather than what exists in future studies.

Keywords: Coach behaviour, practice type, soccer, systematic observation, behaviour analysis.

Gross motor coordination in elementary school children: A gender comparison across key movement tasks

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Abstract: This study examines gender differences in gross motor coordination performance among elementary school children using a comparative analysis of key movement tasks (four sub tests). A total of 510 children (boys: n=260, girls: n=250) participated in the study, with gross motor coordination assessed utilizing Körperkoordinationstest für Kinder test battery (KTK). Data were analyzed using Levene's Test for Equality of Variances and an independent samples t-test to assess differences between boys and girls in four movement tasks: Jumping Sideways, Walking Backwards, Hooping Height, and Moving Sideways. Results indicate no significant gender differences in Jumping Sideways Total ($t(508) = 1.168$, $p = 0.243$) and Walking Backwards Total ($t(508) = -1.042$, $p = 0.298$), suggesting similar performances across genders for these skills. However, a statistically significant difference was observed in Hooping Height Total ($t(508) = 2.745$, $p = 0.006$), where boys outperformed girls. No significant gender-based difference was found in Moving Sideways Total ($t(508) = 0.799$, $p = 0.424$). These findings suggest that while most fundamental motor skills show no significant gender differences, certain tasks such as hooping height may be influenced by physiological or training-related factors. Further research is needed to explore underlying causes and implications for physical education curriculum development.

Keywords: Gender differences, motor skills, elementary school children, physical performance, movement tasks.

Teacher training for motor development and the prevention of sedentary behavior: Active breaks in the primary school curriculum

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Abstract: In the current Italian context, marked by rising levels of sedentary behavior and consequent negative health impacts, there is an evident need for educational interventions that promote movement and regular physical activity. Within the school setting, introducing Active Breaks (AB) as part of the curriculum can support students' well-being and foster more meaningful connections among learning experiences. In this perspective, it is crucial that these interventions be methodologically purposeful, integrating with the content of various subjects. To assist teachers in this educational challenge, a dedicated repository is proposed, where they can find resources, methodologies, and practical proposals organized into categories. Through consultation of this portfolio, a teacher training path is offered, enabling educators to design personalized teaching interventions that ensure inclusion and respect for individual needs, in line with national recommendations.

Keywords: Active breaks, sedentary behavior, teacher training.

Analysis of self-perception in the learning process using metacognitive strategies in physical education among 2nd year highschoolers

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Abstract: The following master's thesis examines the self-perception of the learning process in physical education through metacognitive strategies in a group of 2nd year Secondary Education students in Catalonia, Spain. It compares the perception of their learning experience, their cognitive improvement, their perception of metacognitive strategies, and the level of metacognitive awareness of the teaching staff at the institute where the investigation was carried out. Methodology includes a rugby learning situation for the physical education class, following the Catalan curriculum needs, and applied in the same conditions to all students (n=59) but modifying a single parameter in the two groups created: 1) the experimental group (EG), consisting of classes A and C, to which metacognitive strategies were applied, and 2) the control group (CG), being class B, to which these strategies were not applied. Six instruments were used to analyze the possible differences: direct observation, written tests, individual interviews, and three questionnaires to assess: the students' experience, the students' learning, and the MAIT (Metacognitive Awareness Inventory for Teachers) for teachers. Results indicate an improvement in the perception of the learning experience in the students who used metacognitive strategies in class. There is also an improvement in motivation and active participation compared to the control group, which did not show as much engagement or interest in the subject but in contrast presented better academic performance in the written test. No other relevant differences were detected among both groups.

Keywords: Metacognition, learning process, formative assessment, physical education, metacognitive awareness.

Motor development and related factors of children. Effects of an experimental teaching intervention with different teaching styles

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Abstract: Physical education at school contributes decisively to the child's educational process, but the teaching of motor competencies implies not only a careful selection of tasks and organizational methods, but above all the critical analysis of the methods of presentation of the same (Colella, 2019). An effective didactic-educational process in the field of physical education requires the planning and analysis of the motor task and the equipment to be used, the structuring of spaces and, in particular, the deepening of the relational modalities between teacher, student, class group and environment. The proposal of motor tasks through the use of different strategies and teaching styles makes it possible to enhance the mediation functions in the child's motor learning process and in the promotion of healthy lifestyles (Stodden et al., 2008; Robinson et al., 2015). The following study evaluates and compares the effects of variability of practice and variation of teaching styles through which motor tasks based on the discovery of executive variants, motor development and perceived self-efficacy have been proposed. The sample consists of 5 primary school classes (N = 74 children), divided by gender (males: N= 38, age 8,97±0,82; females: N= 36, age 9,03±0,77). The results, following the didactic intervention (T0 vs T1), show statistically significant differences ($p<0.05$) in all motor tests and in the questionnaire on perceived self-efficacy, in both groups. The didactic intervention was carried out by proposing motor tasks on the variability of practice to promote inclusion, according to references to non-linear teaching (Chow et al., 2007). Production teaching styles, oriented towards enhancing the student's motor responses, promote the learning process and constitute mediating factors for the educational process as they promote the links between motor, cognitive, emotional and social functions.

Keywords: Motor competence, teaching styles, variability of practice, motor development, primary school.

A holistic view of the athlete's personality lighted up with a spark

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Abstract: In the constant, centuries-old confrontation of different thoughts about man, on the theological, psychological, ideological and political levels, two views dominate – man as an individual and man as a personality. In contrast to the theological view that perceives man as a person, in other spheres of social thinking (psychological, ideological and political) the dominant view is that man is an individual; a self-sufficient individual who, in the not-so-distant future, is seen as someone who does not possess his own, private property. In contrast to individuality, as a kind of psycho-ideological concept and the individual as its immediate outcome, personality is the starting point of the centuries-old theological view of man. Therefore, it can be said that personality is a spiritual being who, with his granted freedom, unites those values that approach the otherworldly and transcendent. That is why he is able to react sublimely and with dignity in a given and unforeseen situation. Because, a person is a threefold being, in an inseparable whole of body, soul and holy spirit. With the examples and actions of our athletes, above all Novak Djokovic and Nemanja Majdov, but also others from our country and other countries, we will illustrate the greatness of the personality of athletes illuminated by a spark.

Keywords: Sport, personality, individual, transcendence.

Physical education interventions to improve physical fitness in youth. A systematic review

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Abstract: The physical and mental health benefits of physical activity (PA) are widely recognized, and schools play a central role in promoting healthy lifestyles (Hills et al., 2024). Numerous studies highlight that adolescents do not meet the WHO guidelines regarding PA levels; therefore, educational interventions in school settings aim to increase the amount of PA and improve physical fitness (PF) levels, a key health indicator (Nezondet et al., 2023). However, an increase in PA does not always correspond to an improvement in PF, making it necessary to experiment with effective and sustainable teaching strategies to be implemented in secondary schools. A literature review was conducted using the PRISMA method to analyze the effects of experimental educational interventions, published between 2015 and 2024, carried out in middle and high schools during curricular physical education (PE) classes, aimed at developing physical fitness. Using the following keyword categories: “Fitness”, “Physical education”, and “Intervention”, a total of 287 studies were identified. After removing duplicates, fifteen studies were included. The results showed that the intervention led to improvements in components of physical fitness (PF) in all studies, except for one in which no significant results were observed. Moreover, four studies also reported improvements in related factors and enhanced attention. Cardiorespiratory endurance was the most investigated component and the one that showed the greatest benefits. Most studies (69.23%) had a duration of less than 10 weeks, while only two interventions lasted more than nine months. The studies highlighted that HIIT interventions through strength circuits and gamification activities during physical education classes appear to improve components of physical fitness. Future research should move in this direction to integrate interventions on motor learning and motor coordination, optimize teaching strategies to enhance physical fitness, and promote healthy, active, health-oriented lifestyles in adolescents.

Keywords: Physical fitness, physical education, health, adolescents, school.

Effects of teaching styles on motor competencies learning at school. Preliminary study

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Abstract: Physical literacy (PL) represents a fundamental model for teaching physical education and promoting physical activity in various educational contexts. PL encompasses the interaction of diverse and complementary factors, including motor skills, knowledge, and individual attitudes toward physical activity across different settings and life stages. Physical education instruction is based on the analysis of motor tasks, the selection of equipment and available spaces, and, most importantly, the study of interactions among teachers, students, motor tasks, and the environment, following the ecological-dynamic model of learning. The teaching strategies and methodologies adopted by physical education instructors influence motor learning processes by either facilitating or inhibiting essential educational mediation mechanisms. These processes are crucial for developing students' motor competence and fostering active lifestyles and values. Aim. This study aims to analyze the effects of teaching styles on motor learning and related factors. Methods. A systematic literature review was conducted using the PRISMA model to examine experimental studies that applied the Spectrum of Teaching Styles in physical education in primary and middle schools. The review focused on the relationship between these teaching styles and children's motor, cognitive, emotional, and social development. Thirteen studies were selected, analyzed, and included in the review. Results. The findings indicate that the use of teaching styles in physical education can effectively promote and adapt student engagement and the learning process. The teaching styles model promotes different learning approaches and the relationships among physical literacy (PL) factors. The spectrum follows a continuum ranging from the "command style" (Style A), where the teacher makes all decisions, to the "self-teaching style" (Style K), in which the student independently manages their own learning process. Between these two extremes, nine intermediate styles are identified, each modulating the level of teacher and student involvement, influencing organizational methods and practice variability.

Keywords: Teaching styles, motor competencies, motor learning, physical education, school.

Evaluating PE instruction models in primary education

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Abstract: International organizations, including FIEPS, EUPEA, CEREPS, AIESEP, and UNESCO, have recerntly emphasized the importance of Quality Physical Education (PE) at all levels. While research emphasizes quality PE, comparative studies on teaching models in primary education are limited. This study aims to provide evidence-based recommendations for optimizing PE instruction in primary schools. This project, "Tandem Teaching in Primary Physical Education and its Impact on Motor, Cognitive, and Affective Development," investigates the effectiveness of various PE instruction models in first and third-grade classrooms. These models include instruction by a generalist teacher, a PE specialist teacher, and different tandem teaching configurations (PE teacher and assistant teacher, generalist teacher and assistant teacher, and external sports coach and generalist teacher). Preliminary data from about 200 participants in first and third grade are being analyzed. Pupil physical fitness was assessed using the 20-meter shuttle run, pull-up hold, standing broad jump, and sit-and-reach tests. Basic motor competence was evaluated using the MOBAK test batteries. Self-reported physical literacy was measured using the PLAYSelf questionnaire. Additionally, an ad-hoc questionnaire was used to determine students' out-of-school physical activity levels. Data will be analyzed using statistical methods, including ANOVA and correlation analysis. We hypothesize that results will demonstrate a significant improvement in motor skill development and physical fitness in students taught by PE specialists in tandem configurations. The results will provide insights into the impact of different instructional models on motor skills, physical fitness, and self-reported physical literacy in first and third-grade students. Data collection is currently underway and is expected to be completed by the end of the year. This study will contribute valuable insights into effective PE teaching practices, informing future research and educational policy. This project is supported by VEGA grant number 1/0127/23.

Keywords: Physical education, tandem teaching, physical literacy, primary education.

Classroom management strategies used by physical education teachers in Georgia

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Abstract: Nowadays, School education faces the challenge of renewing its approaches to Classroom management. PE teachers in Georgia are trying to lead physical education lessons, reduce disruptive behavior of students, and establish a good learning environment. The purpose of the research was to define and review which classroom management strategies, rules, and approaches are used by PE teachers in schools of Georgia. The research design was qualitative, using a set of questionnaires. The participants in this study were 60 PE teachers, from Georgia. In your research, purposive sampling was used to select respondents with at least five years of teaching experience. By focusing on teachers with substantial experience, the study aims to gather insights from individuals likely to have a deep understanding of classroom management practices and their impact on student well-being. Based on the findings, most teachers strongly agreed with the positive classroom management techniques. It is necessary for a teacher to show empathy, be kind and polite, build strong connections, and model appropriate behavior with students. But their actions are not completely aligned with modern classroom management practices. According to their perspective, the relationship between teachers and students must be in accordance with school rules and norms. The school lesson should begin with a discussion on discipline and an explanation of the classroom rules. According to the teachers, they must monitor students' behavior, movement, and concentration throughout the lesson. Only then can students have a safe and conducive learning environment.

Keywords: Classroom management strategies, physical education teachers, learning environment.

The effect of the implementation of Hellison model on primary school

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Abstract: The purpose of teaching is to promote social change by fostering students' personal and social development through innovative educational practices. This research aims to improve students' undesirable behaviors and examine the effect of teaching strategies on the development of responsibility based on the Hellison model (Teaching Personal and Social Responsibility-TPSR). Participants included 24 sixth-grade students (14 girls, 10 boys)—the six-month intervention involved two weekly Physical Education sessions focusing on cooperation and self-awareness. The Personal and Social Responsibility Questionnaire (PSRQ) consisted of 14 questions on a 6-point Likert scale (1 = strongly agree, 6 = strongly disagree). Six questions assessed social responsibility, while eight questions assessed personal responsibility. The averages for both dimensions were calculated for each student in the initial and final questionnaires, as well as the differences between them. Results from the Wilcoxon Signed Rank Test showed statistically significant improvements: for social responsibility ($Z = 22.50$, $p = .006$) and personal responsibility ($Z = 30.00$, $p = .002$). Median scores improved from 2.00 to 1.58 for social responsibility and from 2.00 to 1.63 for personal responsibility. These findings indicate a substantial change in students' values and self-awareness, enhancing their perception of responsibility at both individual and collective levels. The intervention helped students recognize the complexity of responsibility in social situations. Overall, the study confirms the effectiveness of TPSR-based interventions in fostering the moral and social development of elementary school students.

Keywords: Personal and social responsibility, physical education, hellison model.

The role of eastern martial arts (TAEKWON-DO) in the formation and development of motor skills in school-age children

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Abstract: Hayk Hakobyan, Training and Pedagogical Faculty, Armenian State Institute of Physical Culture and Sport, Yerevan, Armenia Physical education together with sports training stands out as one of the most vital elements in our daily existence. Physical education helps maintain health and enhance life quality while creating physical and emotional balance in today's world. Physical education and training remain essential elements within modern society because they help to establish mental stability and serve as a fundamental part of developing adults and especially children. The exploration of physical education's future requires analysis of essential indicators that will demonstrate the subject's significance and establish primary research paths. The World Health Organization (WHO) reports an increase in the global population leading sedentary lives following the 2020 pandemic. In 2022 around one-third (31%) of adults worldwide or about 1.8 billion people did not achieve adequate levels of physical activity. The percentage of people leading sedentary lifestyles increased by five points from 2010 levels. World Health Organization statistics reveal that 80% of children and adolescents between 5 to 17 years old fail to achieve the necessary physical activity standards. When children and adolescents do not engage enough in physical activity they face higher chances of developing obesity and cardiovascular diseases along with other health problems. The multiple factors involved show how physical education along with its future development serves as an essential base for human health maintenance.

Keywords: Physical education, taekwondo, physical activity, health, motor skills.

The influence of ball handling and fatigue on cognitive reactive agility performance in basketball players

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Abstract: Fatigue and ball handling are important factors influencing basketball performance, as both physical and cognitive demands are intensified during the game. Increased level of fatigue influence players' decision-making and reaction time, as well as ball handling. This study investigates the combined effects of fatigue and ball handling on performance in cognitive reactive agility tests with varying visual stimulus complexity. The sample of participants consists of Faculty of Kinesiology students who are experienced basketball players. A three-factor ANOVA was performed, and a statistically significant difference was determined between the various levels of test complexity, as well as between the test results depending on whether it was conducted with or without dribbling the ball ($p<0.001$). It can be concluded that in the second and third variation (level of complexity) of the test the participants had issues with recognizing the correct stimuli, which in turn resulted in a slower reaction. But no statistically significant differences were found between the same test complexity levels before and after the fatigue protocol, regardless of whether the test was performed with or without the ball. The methodology used in this research emphasizes the importance of incorporating unpredictable visual stimuli in testing to enhance cognitive decision-making in game-specific conditions. Such protocols could play a crucial role in improving player performance by sharpening motor responses and reactions to game situations.

Keywords: Fatigue, ball handling, cognitive agility, visual stimuli, basketball.

Leisure and aging: Exploring differences in activity engagement and participation motives

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Abstract: Leisure time activities contribute significantly to individual well-being, yet participation patterns vary across different age groups. This study explores the influence of age on leisure activity preferences and the underlying reasons for participation or non-participation. The research involved 268 adults aged 25 and older, who completed a specially designed questionnaire. Data were analyzed using SPSS, employing descriptive statistics and ANOVA to identify significant age-related differences. Results indicate that age is a key determinant of leisure activity selection. As age differences increase, so do variations in preferred activities. Younger adults are more likely to engage in high-intensity physical activities such as fitness, aerobics, and martial arts, whereas older adults favor low-impact options like cycling and yoga. Additionally, differences emerged in participation in creative activities (art, photography, knitting), home-based activities (gardening, pet care), and relaxation-oriented pastimes (reading, watching movies). Age also influences the motives for participation, with stress reduction, health benefits, improved immunity, and self-confidence being the most frequently cited reasons across all age groups. Older adults reported having more personal time and exhibited greater consistency in participation, while younger adults faced more barriers to regular engagement. These findings highlight the evolving nature of leisure preferences and emphasize the need for age-specific strategies to promote active and fulfilling leisure experiences across different life stages. Younger adults, who often face time constraints, could benefit from flexible scheduling and workplace-supported leisure initiatives.In comparison, older adults should be encouraged to engage in community-based programs that foster socialization and lifelong learning. Reducing barriers to participation—such as lack of time, motivation, or resources—can be achieved through targeted communication strategies that align with the interests and motivations of different age groups. These insights highlight the importance of structured interventions to enhance participation, well-being, and social connectedness across all life stages.

Keywords: Leisure time activities, adults, engagement, differences.

Factors influencing the development of PETE students self-efficacy during practicum

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Abstract: Teachers' Self-Efficacy (TSE) is a crucial factor in shaping instructional effectiveness, particularly in engaging students and fostering skill development. Grounded in Bandura's (1977) framework, SE is influenced by four key sources: mastery experience, vicarious experience, social persuasion, and physiological-affective states. This study examined factors affecting TSE in twenty-three (n=23) third-year Physical Education Teacher Education (PETE) students (11 males, 12 females). Participants completed a Teacher Reflection List of TSE sources, three times during their practicum. This list was developed following a literature review on potential sources influencing TSE. A quantitative analysis was performed by calculating the percentage of total responses to each SE source across four possible answers: positive, negative, no impact, or something else. Results revealed that personal characteristics—such as personality traits, motivation for self-improvement, and motivation for teaching—positively influenced TSE. Additionally, teaching skills, including communication, perception, organization, classroom management, adaptability, and creativity, played a significant role. Further analysis highlighted that factors like athletic and academic background, relationship-building skills, and a sustained interest in professional development also contributed to TSE formation. These findings emphasize the multifaceted nature of TSE development in preservice teachers, particularly in PETE students, and underscore the importance of fostering both personal and professional competencies during practicum experiences.

Keywords: Physical education teacher education (pete), self-efficacy, practicum.

Primary school teacher‘s feedback and experiences from tandem teaching of physical and sports education in Slovakia

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Abstract: Physical education, a fundamental pillar of healthy child development, often faces the obstacle of teachers without specialised training in primary education. The "Coaches at School" programme represents an innovative approach to teaching physical and sport education at the first level of primary schools in Slovakia. The principle of the programme is based on the concept of tandem teaching, which consists in the cooperation of a teacher and a coach in conducting lessons. The aim of this study was to evaluate the feedback and experiences of primary school teachers, focusing on their perceptions of coaches' involvement in tandem teaching of physical and sport education within the framework of the "Coaches at School" programme in Slovakia. The research sample consisted of 465 primary school teachers in grades 1 to 4 in Slovakia who were involved in tandem teaching in the 2023/2024 school year. The data obtained by the questionnaire were processed by percentage analysis and the Chi-square (χ^2) goodness-of-fit test was used for statistical processing of the empirical data. Teachers rated the program as attractive to children, with a high level of active involvement of all children, including the less physically able. The presence of a coach had a positive impact on the quality of teaching, and tandem work provided several benefits, including increased safety and teaching efficiency. Future research should assess the long-term impact of tandem teaching on teachers' professional development, teacher satisfaction and ability to adapt to innovative pedagogical approaches. The study is supported by The Scientific Grant Agency of the Ministry of Education, Research, Development and Youth of the Slovak Republic (VEGA) with the grant number č. 1/0127/23.

Keywords: Tandem teaching, primary education, physical education, coaches at school, teacher perception.

Quality physical education and sport in Africa: Introducing artificial intelligence into the teaching and training of pes instructors in national institutes of youth sport

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Abstract: Introduction: The advent of Artificial Intelligence (AI), and GPT Chat in particular, provides additional resources for the quality of sport. The Youth Olympic Games (YOG 2026) in Dakar will be immersed in the AI environment. This study focuses on the introduction of Artificial Intelligence (AI) as a Technical Assistant for Decision Support, Teaching and Research (ATER) to enable students to discover and learn about AI agents. Methodology: The technological approach was used to observe, describe and participate in order to understand, control and transform practices in physical education and sport. We started by configuring and specifically training a GPT as an AI agent, an ATER, and coaching it in the use of "input" data derived from the results of the research carried out in APAS. The GPTs were given precise instructions (configuration of prompts in English and French) on the quality of the 'outputs'. Subsequently, three other AIs were also asked to integrate and generate the outputs. Results and discussion: The outputs were: English and French materials and versions, audio and podcasts, videos and avatars; a summary and evaluation of the input resources; an APAS thematic map; a study guide with quizzes and answers; resources and tools; and a glossary of key APAS terms. Students have experienced and enjoyed the APAS course with avatars and podcasts. Conclusion: AI offers opportunities to promote quality PE that develops active citizenship. It has enabled PES students to familiarise themselves with 'AI tools and resources' in order to master them while respecting and sustaining the environment.

Keywords: Physical education, sports, artificial intelligence (ai), pes instructors, health.

The role of set structure in preserving performance outcomes during vertical jumping sessions

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Abstract: Different set structures can influence jump height and mechanical power performance. While a traditional set structure (TSS) leads to declines in jump height and power, the undulating set structure (USS) helps mitigate this decline during training. This study aimed to investigate the effects of USS on maximal and mean power production, as well as maximal jump height maintenance compared to TSS during vertical jumping sessions. Twelve physically active male participants with jumping training experience completed two separate vertical jump sessions (TSS and USS), each consisting of 144 jumps divided into 12 sets. In the TSS session, each set contained 12 jumps, whereas in the USS session, the number of jumps per set varied between 6 and 18. The TSS protocol included 120 seconds of inter-set rest, while the USS incorporated 60 seconds of inter-set rest and two intra-set rest periods of 30 seconds, totaling 120 seconds. To assess differences between set structures, the percentage decrease in maximal power (%Pmax), mean power (%Pmean), and maximal height (%Hmax) was calculated separately for the first six sets (small volume) and the last six sets (large volume). A two-way repeated measures ANOVA revealed significant differences in %Pmax ($p = 0.016$) in favor of USS. Regarding %Pmean, small volume elicited higher values compared to large volume ($p = 0.026$). For %Hmax, significant differences were found both between set structures (USS > TSS, $p = 0.045$) and training volume (small volume > large volume, $p = 0.045$). These findings highlight the importance of set structure in preserving maximal and mean power, as well as jump height, emphasizing the need for coaches to carefully consider set design when programming training sessions.

Keywords: Cluster set structure, set configuration, training volume, power training.

Pupils' feedback on tandem teaching of physical and sport education in primary schools in Slovakia

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Abstract: Tandem teaching, as one of the dynamically developing didactic strategies, has proven to have a great potential in the process of improving the quality of the educational process. Our research was carried out within the framework of the national program "Coaches in School", which brings to schools an innovative approach to teaching physical education (PE) at the primary schools. Its main goal is to increase physical activity of children in the long term through the integration of sports coaches into the educational process at the primary schools in a tandem way. This study investigated primary school pupils' perspectives on the influence of coaches on PE lessons. The research was conducted as a multi-group pedagogical experiment in 236 primary schools in Slovakia during the school year 2023/2024. The experiment involved a total of 2343 pupils in 1.-4. grades. A total of 30736 PE lessons were taught in tandem. The research sample consisted of (EG, n=1878) pupils in the experimental group who attended tandem PE lessons with a coach and teacher and (CG, n=465) pupils in the control group who attended traditional teacher-led PE lessons. Data were collected via an electronic questionnaire and the relationship between group membership (EG/CG) and pupils perceptions was analysed using a chi-square ($\chi 2$) test. Statistically significant differences were observed in several items of the questionnaire. The results of the research demonstrated the effect of tandem teaching with a coach on the formation of a positive emotional attachment to PE lessons, 86.7% of the pupils in the experimental group rated the lessons taught in tandem as very enjoyable and that they looked forward to the following lessons. The study was supported by the scientific agency (VEGA 1/0127/23) Tandem teaching of physical and sport education in primary school and its impact on motor, cognitive and emotional development of pupils.

Keywords: Tandem teaching, physical and sport education, primary school pupils, younger school age.

Increasing the inclusion of young people with special educational needs through adapted sports activities carried out on snow

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Abstract: Adapted sports activities support the development of physical skills and social behaviors in young people with SEN, facilitating relationships between them and determining them to improve their level of cooperation. At the same time, by promoting and initiating sports competitions held on snow, specially created for this category of young people, the aim was to increase their inclusion and involvement in the community. The data obtained from the study conducted by monitoring 135 young people, aged between 14 and 17, in the last three editions of the winter competition, highlights the evolutionary course of motor and social behavior, the impact on the community, as well as the increase in the level of trust and mutual assistance. The research methodology by analyzing the questionnaires of the study subjects, allowed the interpretation of the data obtained and the conclusion of the reference aspects. Thus, the conclusions drawn highlighted that for 95% of them, there were progressions that highlighted the major role of adapted sports activities held on snow on young people with SEN. Also, their involvement and support by tutors favored an 85% increase in the level of motor skills, which supports an argument regarding the increase in the inclusion of these young people.

Keywords: Adapted sports activities, inclusion, young people with SEN.

How to integrate physical activities in teaching of all curriculum's subjects in whole-day school: The review of evidence from existing european projects outcomes

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Abstract: Whole-day schools represent a model of school organisation where students remain at school from morning (typically 8:00 AM) until afternoon (2:00 PM to 5:00 PM). This school model integrates traditional academic lessons with supervised homework, teaching support or extension, sports, arts, and extracurricular activities, often including meals scheme. In many educations system whole-day schools have become a vital part of educational reform, as is currently case with on-going reform in Republic of Croatia. Whole-day schools addressing several challenges as work-life balance, educational quality, social equity or well-being of students. Prioritizing students' well-being, especially physical health, is one of core elements of reforms goals, where most of whole-day schools models require minimum of 2-3 hours of weekly sports, increasing average time in traditional school organisations. The presentation will provide comprehsive overview of existing european projects (app. 30 of projects) which include research evidence and demonstrate how integrating physical activities into teaching of all school curriculum subjects could enhances educational processes and outcomes across various school subjects. Virtually all projects reported improved student engagement and a subset of projects provided concrete academic improvements measured by direct academic outcomes in math, literacy or another competency domains. Beyond direct academics measures, integrated physical activities in all teaching facilitating teaching across subjects and is demonstrated over various behavioral and pedagogical benefits. In addition, presentation will indicate and summarize observed and demonstrared challenges in integration physical activities through all curriculum's subjects activities (e.g. data paucity, focus on urban space, sustainability issues and lack of long-term impact, teachers training needs). In conclusion, it will be adressed possible solutions and improvements as are the need for rigorous evaluation, comprehensive teacher support, systemic planning of educational reforms to fully harness physical education's potential in education.

Keywords: Whole-day school, PA in teaching, educational reforms.

The effect of yoga exercise on sleep quality, pulmonary function, some physical and psychological fitness parameters in women

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Abstract: The study aimed to examine the physical, physiological, and psychological effects of yoga in women, involving 34 female university students aged 18-22 years (17 experimental, 17 control group).Weight, body weight, water, fat, muscle ratios were measured by tanita, flexibility by reach- reach test, static balance by stork test, dynamic balance by Y test, respiratory functions (FVC,FEV1,PEF,FEV1/FVC)by spirometer and strength by back/leg dynamometer before and 5 weeks after yoga exercise.The data were analyzed in SPSS 25program. Normality analysis confirmed that the data were normally distributed and were analyzed using descriptive analysis, independent sample T test for intergroup comparisons and Paired Samples Test for intragroup comparisons. Descriptive analysis results; mean age of the experimental group was 19.6±1.32, mean height was 165.94±6.82, mean weight was 59.85±9.93, mean age of the control group was 19.29±1.2, mean height was 166.29±6.49, mean weight was 59.97±8.44. Independent sample t-test results showed no significant difference between the experimental and control groups in the pre-test data ($p > .05$).In the post-test data, there was a significant difference in favor of the experimental group in the variables of flexibility ($t(32)=2.395$, $p=.023$, $p=.023$, etasquared=.152) and static balance((($t(32)=3.417$, $p=.002$, etasquared=.267).No significant difference was observed in other variables ($p>.05$).Pairedsamplestests results showed no significant difference between pre-test and post-test data in the control group ($p>.05$). In the experimental group, there was no significant difference in FEV1/FVC ratios among respiratory parameters ($p>.05$), while a significant difference was observed in favor of post-tests in all other variables ($p<.05$). At the end of the 5-week intervention, differences in flexibility and static balance were observed between the experimental and control groups. No improvements were seen in other parameters due to data collection timing. The study is ongoing, and effects on other parameters may appear after 10 weeks. Our data shows that yoga improved flexibility and static balance in women.

Keywords: Yoga, physical fitness, balance, flexibility.

Turkish validation of the adult physical literacy scale: psychometric properties

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Abstract: The present study aimed to translate and adapt the Adult Physical Literacy Scale (APLS), initially developed by Naylor et al. (2024), into Turkish. In this context, the scale was translated and culturally adapted as the "Yetişkinlerde Fiziksel Okuryazarlık Ölçeği (YEFO)." The study sample was selected through convenience sampling, comprising 51.7% female participants (n = 269) and 48.3% male participants (n = 251), with a mean age of 23.2 years. Data analyses were conducted using Stata software. Principal component analysis with Varimax rotation examined the Turkish version's construct validity. As a result of the analysis, one item was removed from the scale, resulting in a five-factor structure with eigenvalues greater than one and consisting of 22 items. The internal consistency coefficients (Cronbach's alpha) were calculated as .94 for the first factor, .93 for the second, .90 for the third, and .93 and .84 for the fourth and fifth factors, respectively. The Kaiser-Meyer-Olkin (KMO) value was found to be .876. The overall internal consistency reliability of the scale was determined to be .90. Confirmatory factor analysis (CFA) yielded the following fit indices: $\chi^2/df = 1.300$, $p < .001$, RMSEA = .103, CFI = .89, TLI = .88, and SRMR = .06. These findings suggest that the Turkish version of the Adult Physical Literacy Scale is a valid and reliable instrument for assessing physical literacy in adults.

Keywords: Physical literacy, literacy, adult physical literacy, scale adaptation, psychometrics.

An active school supporting the dynamic function of the spine in pupils

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Abstract: The school environment plays an important role in promoting postural health in pupils. An active school provides pupils with many opportunities for being physically active. It enables them to be active before school, during the school day, and after classes as well. The Active School concept also includes health-oriented physical activities regularly implemented during breaks. The research was aimed at examining the effect of an active school exercise programme on the dynamic function of the spine in pupils with headaches. The sample consisted of 89 primary school fourth-graders. The pupils completed a 6-week movement programme composed of 12-minute exercises, done 5 days per week during a long break. We used standardised tests to assess the dynamic function of the spine. The results indicate a positive and significant effect of the health-oriented exercise programme on the spine in the lateral and sagittal ($p < 0.01$) planes. In addition, the reduction in muscle tension achieved by regular stretching helped to relax the stiff muscles, which also alleviated pain ($p < 0.01$) in the pupils. The aforementioned findings confirm that spinal flexibility is essential to reducing pressure on the vertebrae and intervertebral discs. Flexibility not only provided physical benefits, such as better posture and increased range of motion, but also psychological relaxation and stress reduction. The listed study is part of the research project VEGA 1/0301/25 titled “Active school promoting the quality of health-oriented fitness focused on postural health of pupils”.

Keywords: Active school, postural health, prevention, pupil.

Examination of nutritional awareness levels of high school students engaged in team sports and individual sports in terms of various variables

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Abstract: The aim of this study is to examine the nutritional knowledge levels of high school students who do team sports and individual sports in terms of various variables. The research group consisted of 197 high school students who did sports in school teams or club teams (individual and team sports) for at least 1 year in high schools affiliated with the Ministry of National Education in the city center of Ankara in the 2024-2025 academic year. In the data collection process, the personal information form developed by the researcher to obtain demographic information about the participants and the general and athlete nutrition information scale developed by Calella, Lacullo, and Valerio (2017) and adapted to Turkish by Altınok and Güvenç (2022) were used. In the study designed in the descriptive screening model of quantitative research methods, parametric tests such as T-test and ANOVA analysis were used. According to the research results, a significant difference was found in the general nutrition knowledge levels of students doing both team and individual sports, as well as between the mother's education levels and the father's education levels. Based on these results, it can be said that the students' general nutrition knowledge levels are better than their sports nutrition knowledge levels and that their parents are more knowledgeable than the students in terms of both general and sports nutrition knowledge levels.

Keywords: Team sport, individual sport, student, nutrition.

What is metabolically healthy obesity?

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Abstract: Obesity is a major public health problem that has reached epidemic proportions worldwide. It is associated with numerous metabolic and cardiovascular disturbances such as insulin resistance, type 2 diabetes, hypertension, and dyslipidemia. However, very low-fat mass can also be associated with such an increased risk. Whether impaired metabolic health, characterized by hypertension, dyslipidemia, hyperglycemia, insulin resistance, and subclinical inflammation, may explain part of the elevated risk of cardiometabolic diseases that is found in many subjects with very low-fat mass, as it does in many obese subjects, is unknown. Observational data from independent studies show that a subgroup of individuals with obesity may be protected from obesity-related cardiometabolic diseases or may be at a significantly lower risk than estimated from the positive association between BMI and cardiometabolic risk. This sub-phenotype has been described as Metabolically healthy obesity and is characterized by the absence of cardiometabolic abnormalities, including insulin resistance, impaired glucose tolerance, dyslipidemia, and hypertension despite excessive body fat accumulation. Metabolically healthy obesity is a novel concept that stratifies obese individuals according to their respective metabolic status. It has important implications for healthcare policies, particularly the efficient allocation of resources in the targeted treatment of obesity and prevention of metabolic disease. In addition, conflicting evidence in the literature regarding its risk profile questions its clinical relevance. However, the lack of a unified definition of metabolically healthy obesity and agreement on its progression further impede its utility as a stratification strategy. This review firstly investigates the epidemiology of metabolically healthy obesity, how metabolically healthy obesity is defined, and secondly, which factors may be important in determining metabolic health status.

Keywords: Body mass index, metabolic health, obesity, risk factors.

Comparison of sports supplement beliefs of exercise and sport sciences and nutrition and dietetics students

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Abstract: In the study, it was aimed to determine and compare the beliefs of the students of the Departments of Exercise and Sport Sciences and Nutrition and Dietetics about sports nutritional supplements and to examine the relationship between the data obtained and gender and grade level. The research was conducted according to the descriptive survey model. In the 2024-2025 academic year, 248 students (159 female, 89 male) who were active undergraduate students at Izmir Democracy University participated in the study. The Sports Nutritional Supplements Belief Scale, the Turkish validity and reliability study of which was conducted by Karafil et al. (2021), was used to assess the participants' beliefs about sports nutritional supplements. As a result of the analyses, significant differences were found in favor of the students of the Department of Exercise and Sport Sciences according to the department of education and in favor of male students according to gender. A significant difference was found between the grade level and sports nutritional supplements beliefs, and it was revealed that the source of the difference was between 1st and 4th grade students. In conclusion, it can be said that the beliefs about sports nutrition supplements of male and 4th grade students studying in the Department of Exercise and Sport Sciences are at a higher level compared to other groups. These students, who will be able to work with individuals who exercise and do sports after graduation, will contribute to the society by taking courses related to sports nutrition and completing them successfully, ensuring that their beliefs in this subject are supported by scientific basis.

Keywords: Sports nutrition, nutritional supplementation, belief.

Posture in relation to BMI index among 10-year-old elementary school students

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Abstract: We are currently seeing an increase in poor posture and body weight. The aim of the study was to determine the relationship between proper posture and the Body Mass Index (BMI) among students in primary education. We applied ex post facto research. The study sample consisted of a total of n=559 students. We compared the groups of boys (n=127) and girls (n=138) from 2015 with the group of boys (n=143) and girls (n=151) studied in 2025 from 26 elementary schools in the regions of Western and Central Slovakia. The differences between the groups were evaluated using basic statistical methods and the statistical methods of Kruskal-Wallis H-test and Mann-Whitney U-test. When assessing the overall posture in relation to the BMI index of elementary school girls in selected regions of Slovakia in 2015 and 2025, we found a significant ($p<0.05$) increase in the BMI index of 0.52, as well as a deterioration in overall posture by an average of 1.5 points. Among elementary school boys from selected regions of Slovakia tested in 2025, we found a significant ($p<0.05$) increase in the BMI index of 0.88 compared to boys tested in 2015. These findings indicate that an elevated BMI index negatively impacts overall posture in both boys and girls in elementary schools in selected regions of Slovakia. The listed study is part of the research project VEGA No. 1/0301/25 “Active school promoting the quality of health-oriented fitness focused on postural health of pupils”.

Keywords: Elementary school, posture, BMI index.

The role of physical activity in active aging

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Abstract: This study examines the relationship between physical activity and active aging. As the population ages, ensuring healthy aging and improving quality of life in later years becomes increasingly important. In many societies, including ours, elderly individuals often adopt a withdrawal-oriented approach, distancing themselves from social life and undergoing role changes that lead to passive aging. However, the activity theory emphasizes that elderly individuals should remain socially engaged and actively integrated into society. Participating in sports and leisure activities enables the elderly to form new social connections and assume active roles, which supports their adaptation to changing life circumstances. Active aging involves maintaining life satisfaction and well-being through continued engagement in physical activities and social life, despite age-related changes, chronic conditions, or the fear of death. Physical activity plays a crucial role in preserving both physical and mental health in old age. It reduces the risk of chronic illnesses such as hypertension, diabetes, anxiety, and depression. Research indicates that elderly individuals who regularly engage in physical activity report higher levels of happiness, better health, and greater life satisfaction. Furthermore, physical activity is instrumental in helping the elderly cope with health challenges, reduce stress and loneliness, and alleviate fear of death. Social participation is closely linked to physical activity, making it a key factor in enhancing the well-being and quality of life of older adults. On the other hand, lifestyle habits such as inactivity, poor nutrition, and substance use negatively affect health outcomes. In this context, encouraging physical and social activity among elderly individuals is essential for fostering a more fulfilling and independent old age.

Keywords: Physical activity, old age, active aging.

Quality physical education and sport in Africa: Introducing artificial intelligence into the teaching and training of pes instructors in national institutes of youth sport

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Abstract: Introduction: The advent of Artificial Intelligence (AI), and GPT Chat in particular, provides additional resources for the quality of sport. The Youth Olympic Games (YOG 2026) in Dakar will be immersed in the AI environment. This study focuses on the introduction of Artificial Intelligence (AI) as a Technical Assistant for Decision Support, Teaching and Research (ATER) to enable students to discover and learn about AI agents. Methodology: The technological approach was used to observe, describe and participate in order to understand, control and transform practices in physical education and sport. We started by configuring and specifically training a GPT as an AI agent, an ATER, and coaching it in the use of "input" data derived from the results of the research carried out in APAS. The GPTs were given precise instructions (configuration of prompts in English and French) on the quality of the 'outputs'. Subsequently, three other AIs were also asked to integrate and generate the outputs. Results and discussion: The outputs were: English and French materials and versions, audio and podcasts, videos and avatars; a summary and evaluation of the input resources; an APAS thematic map; a study guide with quizzes and answers; resources and tools; and a glossary of key APAS terms. Students have experienced and enjoyed the APAS course with avatars and podcasts. Conclusion: AI offers opportunities to promote quality PE that develops active citizenship. It has enabled PES students to familiarise themselves with 'AI tools and resources' in order to master them while respecting and sustaining the environment.

Keywords: Physical education, sports, artificial intelligence (AI), PES instructors, health.

The therapeutic power of swimming: Multidimensional development in babies with special needs

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Abstract: This study aims to explore the developmental processes of babies with special needs through swimming education. Employing a qualitative case study design, the research involved semi-structured interviews with 16 participants, including mothers (n=8), swimming instructors (n=4), and physiotherapists (n=4) of babies who had received swimming instruction for at least six months. Data were collected online via the Zoom platform over a 15-day period and analyzed using a thematic analysis approach. Three primary themes emerged from the data: Dynamic Development of Motor Skills, Learning through Discovery, and Emotional Adaptation. The findings revealed that the swimming process supports motor skills such as muscle strength, balance and coordination in babies; they establish cause-effect relationships through environmental stimuli and interactions and develop learning through imitation. It was also determined that the fear and shyness observed at the beginning decreased over time and were replaced by self-confidence and a sense of success. Overall, the study demonstrates that swimming provides a rich, multidimensional learning environment that supports the holistic development—motor, cognitive, and emotional—of babies with special needs.

Keywords: Babies with special needs, swimming training, dynamic systems theory, motor development, emotional adaptation.

Investigation of the effect of communication skill levels of sport management department students on entrepreneurship

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Abstract: In today's dynamic business environment, entrepreneurship is considered one of the fundamental components of economic growth and social development (Hisrich, Peters, & Shepherd, 2017). One of the most important personal characteristics that entrepreneurs should possess is effective communication skills (Kuratko, 2016). Particularly for individuals aiming to undertake managerial roles in the field of sports, communication is not merely the transmission of information, but also lies at the heart of leadership, teamwork, and problem-solving processes (Weinberg & Gould, 2019). In this context, examining the impact of communication skill levels on the entrepreneurial tendencies of students in Sports Management departments can provide significant contributions to the literature. This study employed a quantitative research approach using the relational screening model. The research group consisted of 253 volunteer students (100 female and 153 male) studying in the Sports Management departments of universities located in the provinces of Trabzon, Giresun, and Gümüşhane. As data collection tools, a "Personal Information Form" developed by the researchers, the "Communication Skills Assessment Scale" developed by Korkut (1996), and the "Entrepreneurship Scale" developed by Yılmaz and Sünbül (2009) were utilized. The data were analyzed using the SPSS 26.0 software package. In addition to descriptive statistics and normality tests, t-tests and one-way analysis of variance (ANOVA) were applied to the data that showed a normal distribution. According to the findings, the variables of engagement in sports and personal income level demonstrated statistically significant differences in terms of entrepreneurship. However, no significant differences were found in communication skills or entrepreneurial tendencies based on gender, university, age, or year of study. As a result, it was determined that there is a relationship between communication skills and entrepreneurial tendencies among students in the Sports Management departments, and that factors such as participation in sports and income level have significant effects on entrepreneurship.

Keywords: Sports management, communication, entrepreneurship.

E-Learning attitudes of talented pre-service teachers: An empirical study on SARS-CoV-2 (COVID-19) period

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Abstract: The attitudes of talented pre-service teachers, who assume important roles in the academic development of individuals, towards e-Learning are critical for the adoption of contemporary educational approaches and the effective implementation of individualised teaching processes. In this study, it was aimed to determine the attitudes of pre-service teachers towards e-Learning in the SARS-CoV-2 period. The sample group of the study consisted of 826 volunteer pre-service teachers continuing their education in the fields of Physical Education and Sports, Music Education and Visual Arts in the spring semester of the 2020-2021 academic year. According to the results of this study in which the 'Attitude Scale towards E-Learning' adapted into Turkish by Biçer (2019) was used; the e-Learning attitude of talented pre-service teachers is close to good with a mean score of 56.55±7.2. Although there was a significant difference ($p<0.05$) in favour of women in the overall total of E-Learning attitudes according to gender variable, no difference in attitude towards e-Learning was detected in the electronic devices preferred in e-Learning activities ($p>0.05$). In addition, according to the variable of the academic unit of study; it was determined that the total score of TELRA in all areas was at close levels ($p>0.05$), the attitudes of pre-service teachers in the field of visual arts in the motivation dimension, and the attitudes of pre-service teachers in the field of physical education and sports in the usability dimension towards e-Learning differed significantly ($p<0.05$). As a result, it was seen that the attitudes of talented pre-service teachers towards e-Learning in the SARS-CoV-2 period were in a moderate level tendency, and these attitudes could be affected by individual and field-based differences in some dimensions.

Keywords: Learning, e-Learning, attitude, pre-service teacher.

Monitoring internal training load, recovery, neuromuscular performance, and muscle fatigue during a 4-week football preseason

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Abstract: The preseason phase in football is characterized by high training volumes, frequent matches, and limited recovery, presenting elevated risks of fatigue and injury. This study aimed to examine weekly variations in internal training intensity (ITI), perceived recovery, neuromuscular performance countermovement jump (CMJ), and muscle soreness during a 4-week preseason in 23 male professional football players competing in the Croatian Second League. A cohort design was employed, with data collected using validated tools: session rating of perceived exertion (sRPE), total quality of recovery scale (TQR) questionnaire, DOMS scale, and CMJ test. Repeated measures ANOVA revealed significant time effects across all variables. ITI showed a large effect ($F(3,66) = 138.29$, $p < 0.001$, $\eta p^2 = 0.86$), with higher values in week 1 compared to weeks 2, and 4. TQR also varied significantly ($F(3,66) = 93.54$, $p < 0.001$, $\eta p^2 = 0.81$), with lowest recovery scores in week 2. CMJ performance significantly declined in week 2 and rebounded in weeks 3 and 4 ($F(3,66) = 26.35$, $p < 0.001$, $\eta p^2 = 0.55$). DOMS values increased significantly in weeks 3 and 4 ($F(3,66) = 8.06$, $p < 0.001$, $\eta p^2 = 0.27$). Repeated-measures correlation analysis showed a strong negative relationship between weekly ITI and TQR ($rrm = -0.72$, $p < 0.001$, 95% CI [-0.84, -0.55]), suggesting that higher training intensity is linked to poorer recovery. Additionally, ITI was negatively correlated with CMJ ($rrm = -0.55$, $p < 0.001$), while CMJ and DOMS showed a positive correlation ($rrm = 0.47$, $p < 0.001$). These findings underscore the importance of using simple, low-cost tools like sRPE, TQR, DOMS, and CMJ to monitor training stress and athlete readiness. Their systematic application can support individualized training decisions, aiding in performance optimization and injury prevention during the preseason.

Keywords: Monitoring athletes, perceived recovery, internal training intensity.

Post-activation performance enhancement in multi- vs single-joint movements: a comparative study of bfr and ems in well-trained volleyball players

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Abstract: Post-activation performance enhancement (PAPE) has garnered considerable interest within the strength and conditioning industry, especially in volleyball, where explosive actions and jump movements are essential. This study had two main objectives. First, it aimed to examine the effects of four different protocols—low-load resistance exercise with blood flow restriction (LLRE-BFR), low-load resistance exercise with electrostimulation (LLRE-EMS), low-load resistance exercise alone (LLRE), and a control condition (CON)—on post-activation performance enhancement (PAPE), grip strength, and serve speed in competitive male volleyball players. Second, it sought to compare the effects of multi-joint versus single-joint exercises used for inducing PAPE. Method: Fifteen competitive male volleyball players (age: 20.93±2.76, training age: 6.87±2.97, height: 180.1±6.43cm; body weight: 83±5.71kg BMI: 23.35±2.45kg/m²) participated. Volleyball players participated in 7 sessions, including baseline measurements at 48 hours intervals and performed bench press and triceps push down exercises with 30% of 1RM, 30-15-15-15 repetitions, 30 seconds rest between sets for LLRE-BFR (AOP 50%), LLRE-EMS (75 Hz), LLRE, Control (CON) protocols. After each protocol, hand grip strength (kg) and serve speed (km/h) were evaluated. Results: Dominant hand (serving hand) grip strength was significantly higher in LLRE-BFR and LLRE-EMS conditions compared to control condition ($p < 0.05$). Although the mean serve speed was higher in other conditions compared to control condition, it did not differ statistically significantly ($p>0.05$). There were also no significant differences between single joint vs multi joint induced PAPE conditions ($p>0.05$). Conclusion: It can be said that blood flow restriction and electrostimulation condition during bench press exercise in male volleyball players significantly.

Keywords: Volleyball, blood flow restriction, electrostimulation, strength, serve speed.

Doping through the lens of mythology

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Abstract: Human beings have strived to be strong since their existence. The definition of the concept of power varies from person to person. For some, the word symbolizes psychological power, while for others, it symbolizes physical power. Human beings cannot be self-sufficient at times. While some accept this situation and make an effort to regain their strength, others do not accept it and resort to various methods. The most important example of the subject in question in the sports community is the use of doping. In this study, examples from mythological stories were given to explain the dangers and consequences of non-compliant behavior to athletes, coaches, and relevant stakeholders in the context of anti-doping. It was aimed to show the target audience what kind of damage unethical methods can cause in the long term professionally, personally and socially through examples selected from various myths and to raise awareness of the group in question in this context. Unlimited desire for power, insatiable ego, uncontrolled desire for promotion and punishments are usually encountered in mythological stories. Some of the myths in question are powerful metaphors that can be used to raise awareness in the anti-doping. In this context, in the stories of mythological figures and some events experienced in the world of sports, there are similarities in the subjects such as not following the rules, using different methods, their emergence and paying a great price as a result. This study aims to emphasize the importance of a person's ethical behavior, following the rules, respecting their opponents, competing on equal terms and displaying their own performance without using any prohibited substances and methods. As a result, it is aimed to draw attention to the subject and to raise awareness about the anti-doping through the mythological stories examined.

Keywords: Doping, mythology, anti-doping.

Positional demands of small-sided games: Impacts on external load in professional footballers

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Abstract: Monitoring training load is an effective method used to meet the training and match demands of football players. Small-sided games encompass the physiological and technical requirements similar to match play. The aim of this study is to investigate the effect of positional differences on external load in small-sided games. A total of 24 players (9 defenders, 9 midfielders, 6 forwards) playing in the Turkish Professional Super League participated in the study. The small-sided game format consisted of 4 vs 4 players on a 30×20 m pitch, played in 4 sets of 4 minutes. As external load variables, acceleration + deceleration (Acc+Dec), high metabolic load distance (m), player load, maximal velocity (km/h), meterage per minute, and player load per minute values were calculated. ANOVA test was used to compare the differences between groups. As a result of the analysis, it was found that external loads in small-sided games did not differ according to playing positions. The lack of difference in the results obtained may be associated with the development of players in line with the game model that teams aim to implement. The fast and dynamic nature of football may have contributed to the reduction of differences between positions and the similarity of physiological characteristics across all positions.

Keywords: External load, small-sided games, football players.

Psychological factors in recreational sport participation: The relationship between anxiety and well-being

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Abstract: Participation in recreational sports activities can be related to psychological factors as an area of intense interest. The anxiety felt during the process of experiencing these activities is important in explaining well-being. The aim of this study was to examine the relationship between recreational anxiety and well-being. The research group consisted of 482 sport recreational activity participants, 245 males (50.8%) and 237 females (49.2%), who were determined by purposive sampling method in recreational parks, areas and facilities. Personal information form and "Recreational Sports Well-Being" and "Recreation Anxiety" scales were used as data collection tools. The analysis of the obtained data was done via SPSS package program. Parametric tests were used for the obtained data since they were normally distributed. These tests consist of t test, One Way ANOVA and Pearson Correlation tests. When the findings obtained from the study analysis results were examined; a significant difference was found between the gender variable and the expectation anxiety sub-dimension. A significant difference was found between the frequency of participation in sports recreational activities and recreational sports well-being. A negative and low level significant relationship was observed between the physical and mental health sub-dimensions and the security anxiety sub-dimension. A negative and low level significant relationship was observed between the life satisfaction sub-dimension and the self-efficacy and social anxiety, physical symptoms, economic anxiety, security anxiety and responsibility anxiety sub-dimensions. A negative and low level significant relationship was observed between the positive feelings sub-dimension and the self-efficacy and social anxiety and security anxiety sub-dimensions. As a result; it is seen that women have high expectation anxiety, well-being increases with age and recreation anxiety decreases. In addition, it was concluded that as security anxiety and self-efficacy and social anxiety decrease, life satisfaction and positive feelings will increase.

Keywords: Recreational sports, anxiety, well-being.

The influence of the 2d:4d finger length ratio on swimming performance

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Abstract: This study aims to examine the relationship between the second-to-fourth digit ratio (2D:4D) and swimming performance in young athletes. A total of 40 swimmers (19 males and 21 females) with a mean age of 12.85 years participated in the study. The participants were selected from a regional swimming competition held in Çorum, Türkiye. Prior to the competition, anthropometric measurements and digit lengths of the athletes were taken using a digital Vernier caliper with 0.01 mm sensitivity. The 2D:4D ratios were calculated by dividing the length of the index finger (2D) by the length of the ring finger (4D) on both hands. Swimming performance was evaluated based on the athletes' 50-meter and 100-meter freestyle race times. Statistical analysis included independent samples t-tests to assess gender differences and Pearson correlation analysis to examine the relationship between 2D:4D ratios, sports age, and performance. Results indicated no statistically significant differences between male and female participants in terms of anthropometric characteristics, digit lengths, or swimming performance ($p>0.05$). Additionally, there was no significant correlation between 2D:4D ratios and swimming times. Interestingly, the average 2D:4D ratios for both genders were above 1.00, which is contrary to commonly reported gender patterns in previous studies. These findings suggest that 2D:4D digit ratio may not be a reliable predictor of performance in closed-skill sports such as swimming, particularly in early adolescence. Future studies should consider larger and more diverse samples, and also explore developmental, hormonal, and genetic factors in relation to digit ratio and athletic performance.

Keywords: 2D:4D ratio, finger length, swimming performance.

Understanding motivational dynamics in personal training studios and open gyms: A self-determination theory perspective

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Abstract: In recent years, there has been a noticeable increase in the preference for Personal Training Studios over Open Gyms. This study explores the psychological and motivational factors underlying this shift through the lens of Self-Determination Theory (SDT). Twenty individuals were interviewed using a semi-structured format, and the data were analyzed thematically based on SDT's three basic psychological needs—autonomy, competence, and relatedness—as well as the five-component framework proposed by Teixeira et al. (2012). The findings suggest that Personal Training Studios create a more need-supportive environment that fulfills individuals' psychological needs, thereby enhancing intrinsic motivation and promoting consistent, self-determined engagement in exercise. In contrast, Open Gyms often fail to provide such support, leading to externally regulated and less sustainable exercise behaviors. This study highlights the explanatory power of SDT in the context of physical activity and emphasizes the importance of designing exercise environments that support basic psychological needs to foster long-term adherence.

Keywords: Self-determination theory, exercise motivation, personal training, open gym, physical activity adherence.

Self-Talk and motivation as predictors of dispositional flow state in athletes

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Abstract: The aim of this study was to examine the relationship between dispositional flow state, self-talk, and motivation in athletes. A total of 219 athletes (116 males [53.0%] and 103 females [47.0%]) voluntarily participated in the study. The research employed a relational survey model. Data were collected using the Dispositional Flow Scale-2, developed by Jackson and Eklund (2004) and adapted into Turkish by Aşçı et al. (2007); the Self-Talk Questionnaire, developed by Zervas et al. (2007) and adapted for the Turkish population by Engür (2011), who also confirmed its validity and reliability; and the Sport Motivation Scale II, developed by Pelletier et al. (2013) and adapted into Turkish by Öcal and Sakallı (2018). The data met the assumptions of normality, and Pearson correlation coefficients were calculated to examine the relationships among the variables. Additionally, regression analyses were conducted to assess the predictive power of athletes' dispositional flow state on self-talk and motivation levels. The results of the multiple regression analysis indicated that dispositional flow state significantly predicted self-talk, accounting for approximately 13% of the variance, and significantly predicted motivation, explaining approximately 24% of the variance. These findings suggest that dispositional flow state plays a meaningful role in shaping both self-talk and motivation in athletes.

Keywords: Optimal performance state, motivation, self-talk, athlete.

The effect of soccer-specific training on functional movement screen scores in male adolescents

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Abstract: The Functional Movement Screen (FMS) is a movement-competency-based assessment tool used to evaluate the quality of fundamental movement patterns. Given soccer's dynamic nature and diverse movement demands, assessing the impact of soccer-specific training on FMS scores is crucial for enhancing movement quality, particularly during critical stages of motor development. This study aimed to investigate the effect of a 12-week soccer-specific training program on FMS scores in adolescent soccer players. Twenty-one adolescents (aged 12–13 years) with no prior structured soccer training participated in the study. The program, conducted twice weekly over 12 weeks, featured technical drills and small-sided games designed to simulate soccer demands. FMS assessments were conducted before and after the training period, and pre- and post-test scores were compared using paired samples t-tests. The results revealed significant improvements in all FMS components, including the deep squat, hurdle step, in-line lunge, shoulder mobility, active straight leg raise, trunk stability push-up, and rotary stability ($p < 0.05$). These improvements are likely attributed to the training program's emphasis on multidirectional movement, agility, single-leg balance, and coordination between the upper and lower extremities, as seen in tasks such as passing, shooting, and dribbling. In conclusion, regular participation in soccer-specific training may positively impact movement quality in adolescents, as reflected by improved FMS scores. These findings support the integration of sport-specific training into youth athletic development programs to enhance functional movement efficiency.

Keywords: FMS, adolescent, football players.

Finding Flow in Nature: The Effect of Flow Experience and Ecorecreational Attitude on Connectedness to Nature

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Abstract: This study aimed to examine the effect of attitude towards ecorecreationand and flow experience on connectedness to nature of ecorecreational activity participants. The research was designed with descriptive and relational screening model from quantitative research methods. The research group consisted of 335 (169 female and 166 male) participants who voluntarily participated and selected with the convenience sample selection method. In addition to the personal information form developed by the researchers, the "Attitude Towards Ecorecreation Scale (ATES)" (Ayyıldız Durhan & Karaküçük, 2020), "Connectedness to Nature Scale (CTNS)" (Bektaş et al., 2017), "Flow Scale (FS)" (İşçi & Güzel, 2019) were used as data collection tools. Since the data was normally distributed, Pearson correlation and regression analysis were performed. A positive and moderate relationship was found between the total scores of CTNS, FS and ATES. As a result of the linear regression analysis performed to determine the effect of flow experience and attitudes towards ecorecreation on the level of connectedness to nature, it was determined that the flow experience and attitudes towards ecorecreation predicted the level of connectedness to nature by 42% (Adj. R2 = .423). As a result of the regression analysis between the sub-dimensions of FS and CTNS, it was determined that the flow experience explained the level of connectedness to nature by 27% (Adj. R2 = 271). Moreover, Attitudes towards ecorecreation were predicted the level of connectedness to nature by 40% (Adj. R2 =405). As a result, flow experience and attitudes towards ecorecreation of individuals participating in ecorecreational activities are important factors that predict their level of connectedness to nature with a significant and moderate level of explanatory power. In this context, it can be stated that the key to establishing a strong connection with nature lies in experiencing flow during ecorecreational activities and developing a positive attitude toward nature.

Keywords: Ecorecreation, flow experience, connectedness to nature.

Leisure experience preferences, consumption styles and life satisfaction of the recreation participants

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Abstract: In this study, it was aimed to examine the relationship between purchasing styles, experience preferences and life satisfaction of recreation activity participants. The research was designed with descriptive and relational screening model from quantitative research methods. The research group consists of a total of 216 (120 male and 96 female) participants who voluntarily participated in recreation activities and selected with the convenience sample selection method. In addition to the personal information form developed by the researchers Recreation Experience Preference Scale (Ayar et al., 2023), the Recreation Product Purchase Style Scale (Şimşek and Hastürk, 2019) and the Satisfaction With Life Scale (Dağlı and Baysal, 2016) were used as data collection tools. Pearson correlation analysis, and regression analysis were used to analyze normally distributed data. The study results revealed that recreation experience preferences and satisfaction with life significantly predict individuals' recreation product purchase behavior. Life satisfaction is an important factor affecting individuals' recreation product purchase behavior; because individuals with high life satisfaction tend to focus more on leisure activities and tend to turn to such products. According to the regression analysis, both variables together explain 22.9% of the variance in recreation product purchase behavior. The results support the idea that consumption behaviors were related to psychological well-being. Although the study provides important insights to practitioners in the field of sports and recreation marketing, its cross-sectional structure and limited sample indicate that future studies with longitudinal and different groups are needed to increase generalizability. In conclusion, this study reveals that individuals' life satisfaction is not only an indicator of their internal well-being, but also a powerful factor shaping their consumption behavior.

Keywords: Purchase, life satisfaction, recreation, experience preference.

The effects of digital fatigue levels of fitness center employees on their job performance

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Abstract: This study aimed to examine the effects of digital fatigue levels on job performance. The potential negative effects of digital fatigue, which is becoming increasingly common in today's business world, especially on fitness center employees who are in constant human interaction, were taken into consideration. The study aims to examine the relationship between digital fatigue and job performance as well as the factors such as psychological resilience, workload management, organizational support and psychological safety that play a role in this relationship. For this purpose, descriptive and correlational survey models, which are quantitative research methods, were used to collect data from 256 fitness center employees determined by convenience sampling method. In addition to the personal information form developed by the researchers, Job Performance Scale and Digital Fatigue Scale (DFS) were used as data collection tools. When the reliability coefficients of the digital fatigue sub-dimensions and job performance scales are examined, Cronbach alpha values are between .776 and .905 and it is seen that the validity and reliability coefficients of the scale are high. Independent t-tests and correlation tests were applied to analyze the normally distributed data. It was seen that no significant difference was found in t-test results according to gender. When the t-test results were analysed according to the workplace variable, a significant difference was found in the physical and mental fatigue sub-dimensions of the digital fatigue scale. A negative and low-level significant relationship was found between job performance and digital fatigue scale sub-dimensions of digital addiction and pressure to stay online.

Keywords: Fitness business, digital fatigue, fitness, social media use, work performance.

Exploring the relationship between pen grip and physical activity frequency in preservice teachers

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Abstract: Pen grip, an essential fine motor skill, has been studied in children with motor impairments, showing developmental and behavioural correlations (Smits-Engelsman, Niemeijer, & van Galen, 2001). However, its relationship with physical activity (PA) remains underexplored in healthy populations. Investigating this connection may reveal new insights into motor behaviours and their predictors, in line with emerging findings linking handwriting to executive control (Rosenblum, Engel-Yeger, & Fogel, 2013). A total of 141 preservice teachers (mean age = 24.7 ± 5.4 years; weight = 60.3 ± 11.4 kg; height = 164.2 ± 17.5 cm; BMI = 21.6 ± 4.8) voluntarily participated in the study. Each completed an online questionnaire developed with Google Modules in Turin, Italy. Participants reported their weekly PA frequency and chose their habitual pen grip among six illustrated options. Data were analysed using a Chi-squared test and correlation to explore associations between PA frequency and pen grip types. Chi-squared analysis revealed no statistically significant association between pen grip type and PA frequency ($\chi^2 = 16.39$, df = 15, p = .358). Correlation analysis showed a negligible relationship between the two variables (r = 0.025, p = .771), suggesting no direct linear trend. This pilot study is limited by a small sample size, a narrow focus on outcome variables, and a physical activity assessment based solely on weekly frequency. Nevertheless, it lays the groundwork for more comprehensive research exploring the relationship between motor patterns, such as pen grip, and lifestyle behaviours, with potential implications for developing school-related skills and higher executive functioning.

Keywords: Hand grip, physical activity, movement behaviour, writing posture.

Physical literacy and leisure engagement in adults: Insights from a study in İstanbul

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Abstract: This study investigates the relationship between physical literacy and leisure activity participation among adults, with particular attention to differences across gender and various sociodemographic factors. Employing a relational survey design and convenience sampling method, data were collected from 652 adults aged 18 to 30 (M = 23.2, SD = 3.4) residing in Istanbul. The sample consisted of 336 women (51.53%) and 316 men (48.47%). Data were gathered using a two-part instrument: the first section recorded participants' sociodemographic characteristics, while the second included the Adult Physical Literacy Scale (Özdemir et al., 2025) and the Leisure Activity Participation Scale (Şimşek & Çevik, 2020). Descriptive statistics and independent samples t-tests were used to compare mean scores between groups. Additionally, logistic regression analyses, adjusted for age and gender, were conducted to examine associations between dichotomous variables and the measured outcomes. Statistical significance was set at $p < 0.05$. The findings revealed no significant gender differences in the sub-dimensions of physical literacy, except for the "Confidence" factor, where a significant difference was observed. In contrast, significant gender-based differences were observed across several dimensions of leisure activity participation. Moreover, participation in structured recreational activities, perceived economic well-being, satisfaction with leisure time, budget allocated for leisure, and membership in community or student organizations were all significantly associated with leisure engagement. Among the two instruments, the Leisure Activity Participation Scale demonstrated greater sensitivity to sociodemographic differences. The results suggest that leisure participation is shaped by a variety of social and economic factors, and that the Leisure Activity Participation Scale is an effective tool for identifying these differences in young adults.

Keywords: Physical literacy, leisure participation, recreational activity, sociodemographic factors.

Investigation of leisure time management and internet use in leisure time of sport sciences students

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Abstract: Leisure time management refers to the effective planning and efficient use of free time (Kleiber, Walker, & Mannell, 2011). With technological advancements, university students increasingly spend their free time using digital tools and engaging in internet-based activities (Lepp, Barkley, & Karpinski, 2014). For sport sciences students, how leisure time is managed is significant not only for personal well-being but also for professional development. This study aims to examine the leisure time management skills and internet usage habits during leisure time among students in the Faculty of Sport Sciences at Trabzon University. A relational survey model, a type of quantitative research, was employed. The study group consisted of 211 students (87 female, 124 male). Data were collected using a "Personal Information Form" developed by the researchers, the "Leisure Time Management Scale" by Akgül and Karaküçük (2015), and the "Leisure Time Internet Use Scale" by Şimşek and Çevik (2023). The data were analyzed using SPSS 26.0, with descriptive statistics, normality tests, and t-tests applied to normally distributed data. The findings revealed significant gender differences in the sub-dimensions of goal setting and method, evaluation, and leisure time attitude within the leisure time management scale. Likewise, significant gender-based differences were found in internet use sub-dimensions such as social development, shopping, and information acquisition/personal development. Female students scored higher in these areas, suggesting they may have a more organized and conscious approach to managing their free time. Additionally, it appears that women use the internet more for self-improvement and social interaction during their leisure time.

Keywords: Time management, leisure time, internet usage.

Transcending cognitive training through spiritual leisure

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Abstract: This review addresses the application of cognitive training techniques, including breathwork, self-reflection, mental imagery, and self-talk, by athletes to enhance performance and facilitate self-transcendence experiences within the realm of spiritual leisure. Empirical research indicates that these techniques enhance attentional control, emotion regulation, and resilience under pressure; however, their deeper spiritual dimensions remain unexplored. Self-transcendence is conceptualized as both the realization of individual potential and the transcendence of the self towards greater meaning, purpose, and connection. Athletes strive to surpass their limitations and frequently report altered states of consciousness, self-expansion, assimilation, a diminished sense of separateness, and moments of unity with their environment, which serve as evidence of transcendental experiences. These observations suggest that athletes perform to transcend themselves and recreate their being. Drawing on existential, humanistic, and positive psychology frameworks (e.g., Frankl, Fromm, Jung, Maslow, Wong), this paper examines how spiritual leisure training can enhance athletes' performance together with sense of meaning, self-expansion, and purpose. In summary, this study highlights the importance of spiritual leisure training beyond physical and cognitive training. Furthermore, this review synthesizes empirical findings from various disciplines, including sports psychology, leisure studies, and human development. The findings advocate for a broader understanding of sports as a transformative practice that enables individuals to realize their higher selves and recreate their being. In conclusion, this study emphasizes that sports are profoundly spiritual spaces for self-transcendence and flourishing.

Keywords: Self-transcendence, spiritual leisure training, recreation, flourishing.

Psychological reflections of wearable technologies in young elite football players: A phenomenological study

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Abstract: Wearable technologies have become widely used in recent years for monitoring performance and tracking development in sports. While these technologies primarily provide physical data, they are also thought to influence athletes' psychological processes. This study aims to understand the experiences of young athletes with GPS-based wearable technologies and to reveal the impact of these technologies on their motivation, anxiety, and cognitive processes. This study was conducted using a phenomenological design, one of the qualitative research approaches. The participants consisted of 9 young elite football players (5 female, 4 male), aged between 15 and 22, all of whom have competed at the national team level and regularly used GPS-based wearable technology during training and matches. Data were collected using a semi-structured interview form. All interviews were conducted via telephone in environments chosen by the participants, with each lasting approximately 10–15 minutes. Audio recordings were transcribed verbatim and analyzed using thematic analysis. Thematic analysis revealed that athletes' experiences clustered under two main themes: positive effects and negative effects. Positive effects included increased motivation, self-improvement through self-evaluation, and constructive competition within the team. Negative effects involved stress, anxiety, and ruminative thinking patterns following low performance data. Participants stated that being monitored by coaches sometimes created a sense of pressure. While wearable technologies contribute to the performance development of young athletes, they also influence psychological processes. The findings of the study indicate that these technologies can enhance motivation and awareness, but may also lead to stress, anxiety, and ruminative thinking in some individuals. Therefore, it is important for coaches and professionals to use such tools with consideration of individual psychological differences.

Keywords: Wearable technology, young athletes, motivation, rumination, stress.

The relationship between academic focus levels and self-efficacy of sport sciences students

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Abstract: This study aimed to examine the relationship between academic focus levels and self-efficacy perceptions of university students studying in the field of sport sciences. The study was conducted with a total of 395 (200 male and 195 female) sports science students studying at various universities in Istanbul in the 2024–2025 academic year. The study was based on quantitative methods and used the relational screening model. As data collection tools, the "General Self-Efficacy Scale" adapted to Turkish by Aypay (2010) and the "Academic Locus of Control Scale", the validity and reliability studies of which were completed by Akın (2007) were used. The SPSS 25.0 statistics program was preferred in the analysis of the obtained data. Since the data showed a normal distribution, more reliable results were obtained by applying parametric tests. According to the research findings, there was a significant difference between the gender variable and the self-efficacy levels and academic focus levels of sports science students. No statistical difference was found between the age, department and class variables and the self-efficacy levels and academic focus levels. However, there was a positive and significant relationship between students' self-efficacy levels and their academic focus levels. This result showed that students can focus more on their studies as their self-confidence increases. As a result, including more practices aimed at developing self-efficacy skills in educational programs can make significant contributions to increasing students' academic success. In this context, faculty members and educational administrators should prioritise strategies that support self-efficacy

Keywords: Sports, focus, Self-efficacy.

Effect of recreational physical activity on academic self-efficacy and stress management in universities

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Abstract: This study aimed to evaluate the effects of recreational physical activity on academic self-efficacy and stress management of university students and the relational screening model was used in the research. As data collection tools, the personal information form developed by the researchers in the first part, the Academic Self-efficacy Scale developed by Jerusalem & Schwarzer (1992) in 1981 and adapted to Turkish by Kandemir, 2010, the Short Form of the Perceived Stress Scale adapted to Turkish by Kocapınar and Ekşi, 2024 in the third part and the Motivation for Participation in Physical Activity Scale developed by Tekkurşun-Demir and Cicioğlu (2018) in the last part were used. The data were transmitted via Google Forms and the study was based on volunteering. A total of 481 participants were reached. SPSS 25.0 package program was used in the data analysis part. In order to determine the univariate extreme value, z statistics and box plots were examined and analyses were performed on 9 observations determined as extreme values and 472 data that were not included in the data set. When the "skewness" and "kurtosis" coefficients were examined to check the normal distribution condition, it was seen that the data were between "-1.5 and +1.5". Descriptive statistics, t test, One-Way ANOVA, Pearson Correlation test and Tukey test were used as statistical methods in the evaluation of the data. As a result of the correlation analysis, significant relationships were determined between the variables of leisure time barriers, motivation and life satisfaction. In the regression analysis conducted to determine the mediating role of motivation in the effect of leisure time barriers on life satisfaction, it was determined that leisure time barriers had a negative and significant effect on life satisfaction, but motivation played a partial mediating role in reducing this effect.

Keywords: Physical activity, academic self-efficacy, stress management.

Determining the importance levels of recruitment criteria for health and fitness centers

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Abstract: This study aims to examine the recruitment criteria of health and fitness centers using the Analytic Hierarchy Process (AHP), a multi-criteria decision-making technique. The research was conducted using a quantitative descriptive design, and criterion-based purposive sampling was employed to determine the study group. The participants consisted of eight senior-level managers with a minimum of 10 years of experience in the health and fitness industry. The data collection tool was developed based on the codes and themes from Eraslan (2022), and data were gathered through semi-structured interviews. The collected data were analyzed using the AHP method. According to the findings, in terms of professional competencies, knowledge transfer skills and domain expertise were identified as the most significant criteria, while professional certification was considered the least important. Regarding personal skills, communication and openness to development ranked highest, whereas being energetic and self-confidence had lower importance. Additionally, the most valued service expected from exercise specialists was the ability to design post-injury strength training programs. In conclusion, recruitment practices in health and fitness centers prioritize individuals who possess not only formal qualifications but also strong communication skills, a desire to improve, and applicable field knowledge.

Keywords: Analytic hierarchy process, recruitment, fitness, professional competence, decision making.

Mega sporting events and their socio-environmental sustainability legacy: A critical review of the olympics and the FIFA world cup

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Abstract: This review paper critically examines the socio-environmental sustainability legacy of mega sporting events, with a particular focus on the Olympic Games and the FIFA World Cup. While these events are often promoted as catalysts for economic development, they also have profound and long-term social and environmental implications for host cities and nations. The existing literature presents both optimistic perspectives and critical reflections on the alignment of such events with sustainable development principles. The main objective of this study is to analyze the sustainability legacy of mega sporting events through dimensions such as social inclusion, urban transformation, environmental awareness, resource efficiency, and climate change mitigation. Special attention is given to recent sustainability frameworks adopted by the International Olympic Committee (IOC) and FIFA, along with their practical implementations. This review is based on peer-reviewed articles, official reports, and documents published by international institutions (e.g., IOC Sustainability Strategy, 2021; FIFA Climate Strategy, 2022). The findings highlight the significant potential of mega sporting events to contribute to sustainable legacies, yet emphasize that realizing this potential depends on inclusive policy design, active public engagement, and transparent monitoring mechanisms.

Keywords: Mega sporting events, sustainability legacy, social and environmental impact, olympic games, FIFA World Cup.

A study on future anxiety among students of the faculty of sports sciences based on various variables

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Abstract: This study investigates the future anxiety levels of students enrolled in sports sciences programs with respect to various demographic variables. Designed within the framework of quantitative research, the study utilized relational screening and causal-comparative methods. The sample consisted of 461 students selected through a non-probability sampling method, specifically convenience sampling. The data were collected using the "Future Anxiety Scale in University Students" developed by Geylani and Çiriş Yıldız (2022). Prior to analysis, normality assumptions were tested, and parametric tests were applied accordingly. Results revealed that students had above-average levels of future anxiety. Moreover, significant differences were determined based on gender, age, and foreign language proficiency. These findings indicate that both personal and educational background variables may influence students' levels of future anxiety. The study provides insights that can inform psychological support practices and educational policies aimed at enhancing student well-being.

Keywords: Future anxiety, Sports sciences, University students, Psychological well-being.

Evaluating Paris 2024: Insights from Sports Management Sciences Academics

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Abstract: The Olympic Games are a significant event that reinforces the understanding of peace, friendship, and tolerance at the international level within the sports world, enhances cultural interaction, and showcases the cultures of host countries. In this context, the study employed a qualitative research method using a case study design to conduct an in-depth examination of the views of academics working in the Faculty of Sports Sciences regarding the 2024 Paris Olympics. The research was designed to understand the impact of the Olympics on the field of sports science, the perceptions within academic circles, and the reflections of these events on societal values. The participant group consisted of ten academics from the Faculty of Sports Sciences at Ankara University. These academics are professionals specialized in various disciplines such as sports science, sports management, coaching, and physical education. In the study, in-depth interviews were conducted using a semi-structured interview form. During the data collection process, the participants thoughts on the Paris 2024 Olympic Games were recorded using a voice recorder. Data analysis was performed using qualitative analysis software, and the findings were examined within the framework of how the Olympics shape perceptions in the field of sports science, cultural interactions, and societal values. The results of the research emphasize the effects of the Olympics on sports science education and practices, contributing to a better understanding of these events from an academic perspective. Thus, it is understood that the Olympic Games create a profound impact not only as a sporting organization but also within cultural and social contexts. This research aims to make significant contributions to the academic literature in the field of sports sciences while also establishing a foundation for future research.

Keywords: Paris 2024, olympic games, sports management.

Evidence based sport-concepts for health - From school-children to elderly

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Abstract: Global levels of physical activity have declined significantly due to increased sedentary lifestyles and urbanization. This reduction is strongly linked to a rise in non-communicable diseases such as heart disease, diabetes, and obesity. Schools are ideal environments for promoting physical activity because they reach nearly all children, regardless of socioeconomic background, in a structured and consistent setting. By integrating active routines into the school day, they can help level the playing field and ensure equal opportunities for health and well-being across diverse social profiles. Thus, physical activity models for schools are warranted.

The 11 for Health and FIT FIRST programs are efficient physical activity models for schools because they combine structured exercise with educational content, making physical activity engaging and purposeful. Both programs are evidence-based, scalable, and designed to fit seamlessly into the school curriculum, enabling schools to improve student fitness and health outcomes across diverse populations with minimal resources.

The 11 for Health program is a school-based initiative, which leverages the global appeal of football to educate children aged 10 to 12 about health issues and promote physical activity. The program combines football skills training with health education, delivering messages on topics such as hygiene, nutrition, and disease prevention through engaging, football-themed sessions. By integrating physical activity with health education, 11 for Health aims to improve children's knowledge, attitudes, and behaviors related to health, while also encouraging regular physical activity.

The FIT FIRST program is a school-based physical activity initiative to enhance children's health and fitness through structured, high-intensity, and inclusive sessions. It was originally designed as Frequent Intense Training through Football, Interval Running, and Strength Training, but has since evolved to include a variety of sports and activities tailored to different age groups. The activities are crafted to be enjoyable and engaging, promoting cardiovascular fitness, muscle strength, and bone density through high-intensity games inspired by various sports, including ball games, athletics, and martial arts.

In conclusion, addressing the global decline in physical activity requires accessible and effective solutions, and schools are uniquely positioned to play a central role in this effort. Programs like 11 for Health and FIT FIRST demonstrate how structured, engaging, and evidence-based physical activity models can be successfully integrated into the school environment to promote health, fitness, and well-being among children across all social backgrounds.

Keywords: Sport-concepts, school, children.

Winning on both fronts: the science of success in sport and education

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Abstract: The concept of dual careers—where athletes simultaneously pursue elite sport and formal education—has emerged as a key focus of sport policy and research across Europe. As the competitive demands on athletes intensify and the need for life after sport becomes more pressing, the dual career paradigm serves as a strategic response to ensure holistic athlete development and long-term well-being.

This research offers a scientific overview of the dual career landscape in Europe, underpinned by recent interdisciplinary research from different subdisciplines of sport science (sports pedagogy, education, psychology, sociology etc.). It explores critical success factors that enable athletes to manage dual demands, including flexible learning pathways, institutional support mechanisms, psychosocial resources, and effective time management strategies. The research also reviews current policy frameworks and legislative approaches at the national and European Union levels, including the implementation of the EU Guidelines on Dual Careers of Athlete.

Emphasis is placed on evidence-based practices in both secondary and higher education settings, with case studies of successful dual career models illustrating the value of coordinated efforts between sports clubs, educational institutions, and governing bodies. The roles of coaches, teachers, parents, and policy-makers are examined as part of a multi-stakeholder ecosystem that supports athlete success both on and off the field.

Finally, the research addresses challenges such as dropout risk, academic underperformance, and career uncertainty, arguing that dual career support systems are essential for fostering not only athletic performance but also personal development, employability, and social inclusion. This contribution underscores the need for sustainable, athlete-centered strategies that empower young people to thrive in both sport and education—truly winning on both fronts.

Keywords: Dual career of athletes, education of athletes, EU guidelines.

School physical education reduces sedentary lifestyle and improves behavioral and metabolic indicators

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Abstract: The modern sedentary lifestyle, along with technological advancements and reduced physical activity, poses significant challenges to public health, particularly among school-aged children. This lecture explores the key role of school physical education (PE) in mitigating sedentary behavior while fostering improvements in behavioral and metabolic health indicators. Regular physical activity in schools has been shown to decrease sedentary time and promote positive behavioral outcomes, including enhanced focus, reduced anxiety, and improved social interactions. Moreover, it positively influences metabolic health by reducing the risk factors associated with obesity, diabetes, and cardiovascular diseases. These benefits are particularly critical during developmental years, where lifestyle choices have long-term implications for physical and mental well-being. The lecture emphasizes integrating diverse, engaging, and inclusive activities within PE curricula to address varying interests and physical abilities. It also discusses the role of teachers and policymakers in designing programs that align with health promotion objectives while fostering an enjoyable and motivating environment for students. Highlighting the impact of school PE on reducing sedentary behavior and improving health outcomes, this lecture advocates for prioritizing physical education as a critical component of holistic education and public health strategies.

Keywords: Physical education, sedentary lifestyle.

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POSTER ABSTRACTS

Health-behavior predictors of physical endurance among school students

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Abstract: Poor physical endurance (PE) is decreasing across the world resulting in an earlier risk of health disorders and causing a financial burden for the country. This study aimed to investigate the health-related behavioral correlates of physical endurance. The population-based study included 3129 school students aged from 11 to 19 years, with a mean age of 14.08 (2.21). Among them 49.8 were boys. 20m Shuttle-run test was used to evaluate PE. Physical activity (PA) was identified by the question if a student is physically active every day until sweats for at least one hour per day. Physical inactivity was evaluated by asking how many hours per day the student usually spent sitting. Diet - using the Kidmed questionnaire. Sleep - by asking how well students usually sleep. Gender, age, and body mass index were considered covariates in the linear regression analysis. The results revealed that 15.4 percent were physically active at the recommended level, 4.61 (3.03) hours per day were spent sitting, and 42.4 percent had high adherence to a healthy diet, 50.0 percent had good sleep. PE was significantly predicted by better adherence to a healthy diet, being physically active enough, and better sleep, but not by physical inactivity. Male gender, older age, and being not overweight and obese were also significant predictors among covariates. Conclusion: health-related behavior, particularly healthy diet, PA, and sleep, is important to consider in school-based health-enhancing interventions as it is directly related to physical endurance, which is an important indicator of cardiovascular health and longevity.

Keywords: Health-behavior, endurance, school students.

Accelerometer-measured physical activity on Bulgarian students

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Abstract: Physical activity is one of the main components of the healthy lifestyle. According to World Health Organization (2020), adults should do at least 150-300 minutes of moderate intensity physical activity, or 75-100 minutes of vigorous intensity aerobic physical activity. The aim of this study was to measure the volume and intensity of physical activity on Bulgarian students. The measurement was held in one week of October, with fifteen 1st course, and fifteen 3th course students from National Sports Academy “Vassil Levski”. There were used 3-axis logging accelerometers Axivity AX3, and a questionnaire. Descriptive statistics was used for processing the data with SPSS statistics 27.0. The results show that each student covers the recommendations of World Health Organization for daily physical activity. 3th course students have more voluminous physical activity with moderate (: 1st course – 94,6min.; 3th course – 147 min.) and vigorous (: 1st course -7,8 min.; 3th course – 7,3 min.) intensity in a week than first course students. It was seen an inconsistency between the data in the questionnaire and Axivity AX3 bands. In questionnaires 1st course students shared they had more-voluminous physical activity than 3th course students shared. Data from Axivity AX3 bands showed the opposite. In conclusion, good tendency is that each student had reached the recommendations from World Health Organization for daily physical activity.

Keywords: Moderate- to vigorous physical activity, students physical activity, World Health Organization.

Analysis of the forehand topspin shot in table tennis: A systematic literature review (2014–2024)

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Abstract: The forehand topspin stroke is a fundamental shot in table tennis, widely recognized for its effectiveness in offensive play. This systematic review analyzes scientific studies from 2014 to 2024, focusing on the biomechanical, kinematic, and technical aspects of the forehand topspin shot. Through a literature search in SCOPUS, MEDLINE, and EBSCOHost, eight relevant studies were identified and examined. The findings highlight key factors influencing shot execution, including wrist joint angles, trunk positioning, and lower limb engagement. Notable differences were observed between male and female players, with males demonstrating higher arm acceleration and power. Additionally, muscle activation patterns and training implications were discussed, emphasizing the importance of targeted conditioning programs for both upper and lower body strength. The review also considers the impact of equipment changes, particularly the transition from celluloid to plastic balls, on shot mechanics and playing dynamics. The results underline the necessity of individualized coaching strategies to optimize shot efficiency and adaptability. This study provides valuable insights for players, coaches, and researchers aiming to refine technical execution and enhance competitive performance in table tennis.

Keywords: Forehand topspin, biomechanics, kinematics, performance analysis.

Gender differences in physical activity and sedentary behavior among students aged 9 to 11 years

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Abstract: In the context of modern trends of physical inactivity and increased sedentary time, identifying gender-specific lifestyle differences in children is essential for designing effective public health interventions. This study aimed to examine differences between boys and girls aged 9 to 11 years regarding their participation in physical activity and time spent in sedentary behavior. The study included 415 participants (205 boys and 210 girls), randomly selected from primary schools in the Skopje region. Validated questionnaires were used to assess four variables related to physical activity and six variables related to sedentary behavior. The results revealed statistically significant gender differences ($p<0.05$). Boys reported greater frequency and total time in organized sports activities (average 3.4 days/week), while girls were more involved in unstructured, moderate-intensity physical activities. In terms of sedentary behavior, boys spent considerably more time in front of screens, particularly during weekends (average 4.8±1.1 hours/day), indicating a concerning behavioral pattern. These findings highlight the necessity of developing gender-sensitive intervention programs: girls should be encouraged to participate in higher-intensity activities, while strategies targeting boys should focus on reducing sedentary habits. Such approaches are crucial for early prevention of negative health outcomes and for fostering a healthy, active lifestyle from a young age.

Keywords: Physical activity, sedentary behavior, gender differences, students, primary education.

Can beach soccer supplement training on conventional surface in young soccer players?

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Abstract: Sand surface has been proposed as an alternative training tool to improve, exercise intensity, and lactate production or to bring the injured player closer to return to play and reduce the injury risk (Arazi et al., 2016; Sannicandro et al., 2023). The study aims to understand whether beach soccer can be recommended as supplementary training for young Under-15 soccer players. Methods: 14 young soccer players (age: 14.11 ± 0.55 years, body mass: 49.77 ± 8.21 kg; stature: 160.91 ± 7.14 cm, training background: 6.02 ± 2.32 years) participated to the study. Performance was carried out on a sand field with beach soccer ball, for 3x12min each. Internal load (IL) and external load (EL) were recording during/at the end the match. All soccer players were used to work with GPS monitoring systems and heart rate (HR) monitors. Results: IL values obtained show that the beach soccer match imposes high cardio-vascular intensity: about 76% of the distance covered results in a HR value between 80-100% of HRmax, with an average HR of about 95% of HRmax. The playing time for each player was 24.12±1.16min. The total distance covered and the distance achieved per minute of play were 2185.66±264.22m and 74.15±7.19m, respectively. The peak speed reached was 17.91±1.53km/h while the average speed observed was 4.69±0.66 km/h. The distance measured in moderate-and high-intensity running was significantly lower than the value of low-intensity running (P=.0002). Conclusions: Sand training can be suggested to supplement conventional surface training for the young U15 soccer player. Sand match imposes high HR values and can reduce reiterated loads on lower limb joints.

Keywords: Beach soccer, young soccer player, sand, external load.

Acute effects of repetead sprint ability on landing technique in young female soccer players

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Abstract: This study aims to (a) analyze landing technique in subelite young female soccer players, (b) understand whether repetead sprint ability (RSA) fatigue negatively affects landing technique. Methods: The sample is composed of female young soccer players Under 15 (n=23, 14.22±0.67 years, weight: 64.9±5.6 kg; height: 149.9±4.8 cm). Participants performed a Landing Error Score System (LESS) test (Limroongreungrat et al., 2022) after a traditional warm up and after an intense exercise of repeated sprints with incomplete recovery. The RSA protocol (Gabbet, 2010; Bishop et al., 2011) involved performing 6 repetitions of 20m (15 seconds after every 20m and 3 minutes after the 6 repetitions); this exercise was repeated for 3 sets for a total of 360m. All exercises were performed requiring all-out intensity. Results: The LESS assessment for the post traditional warm-up/pre-fatigue and post RSA protocol condition showed a value of 5.32±0.66 and 8.96±0.65, respectively; this value was statistically significantly higher than the pre fatigue condition ($p>0.001$, ES: 1.49). Conclusions: the role of fatigue on landing technique requires careful analysis in young prepubescent female athletes, in light of the knowledge derived from the literature: in fact maturation determines certain gender differences in both vertical jump performance and landing ability, where girls are unable to reduce ground reaction force during landing in high jump trials. The landing technique assessment becomes an indispensable time to intervene in training sessions and introduce effective compensatory exercises for young female athletes.

Keywords: Fatigue, landing, women soccer, injury prevention.

Aerobic capacity and somatotype in relationships with the playing position on female football players

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Abstract: In football, determining the aerobic capacity of the players is of key importance in all teams and serves as a control in the development of the quality of endurance. Maximal oxygen consumption (VO2max) is defined as the "gold standard" for assessing aerobic capacity in endurance sports. For female football players between the ages of 15-18, the playing position has already been established. The position determines specific requirements to the aerobic capacity, to the body composition, and to the somatotype of the female football players. The aim of the present study was to investigate the relationship between the playing position of 15-year-old female football players and their somatotype and aerobic capacity. The study involved 19 female adolescent football players, with a mean age of 15.2 ± 1.3 years; the mean height was 166 ± 4.7 cm, and the mean weight was 55.6 ± 6.5 kg. The mean BMI was (kg/m2) 20.14±2.07. The mean Fat % of the defenders was 17.1±3, while that of the forwards was 14.4±4. The goalkeeper was only 1 person, with Fat % of 14.9, statistical significance of the difference p = 0.017. The mean VO2max of the defenders was 47.4±3.7, while that of the forwards was 52.8±4.7. The goalkeeper was only 1 person, with VO2max of 43.9, statistical significance of the difference p = 0.018. The mean somatotype of the defenders was 3.7±0.8 - 4.2±0.9 - 2.7±1.0, while that of the forwards was 2.9±0.8 - 3.3±0.8 - 4.0±0.9. The goalkeeper was only 1 person, with somatotype of 2.8 - 3.9 - 2.9, statistical significance of the difference p = 0.01 - 0.029 - 0.01. The forwards had lower Fat % and higher aerobic capacity compared to the defenders. Determining the somatotype can further help the selection of an appropriate playing position in adolescent female football players.

Keywords: Adolescent female football players, somatotype, aerobic fitness, fat %, playing position.

The effects of additional recreational football program in Serbia primary school

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Abstract: Being overweight at a young age can raise the likelihood of developing chronic diseases later in life. The aim of this study was to examine the effect of introducing the additional recreational football program in Serbia, on body composition, and motor abilities tests. Thirty-nine 3rd grade schoolchildren (Boys: N= 71; age= 10.21; body high= 144.47; body mass= 40.4 and Girls: N= 39; age= 9.25; body high= 142.16; body mass= 36.96) participated in the 14 weeks recreational football. The program were consisting of 2 × 45 minutes per week with of FIFA 11+ kids warm-up, football drills, and small-sided games. Pre- and post-intervention, the participants completed body composition tests (body mass index, body fat percentage, muscle mass percentage) and motor abilities tests (sprint 20m, arrowhead agility test, horizontal jumping ability, postural balance, and Yo-Yo intermittent recovery children's test. Between pre- and post-intervention differences were observed in change scores for body composition and motor abilities tests in favor of final testing compared with initial testing both genders. Statistically significant changes in body composition compared to pre- and post-intervention occurred in boys in muscle mass ($p \leq 0.008$), while in girls there were changes in the percentage of body fat ($p \leq 0.006$) and muscle mass ($p \leq 0.007$). Motor abilities tests differ significantly in both boys and girls in the following tests: for girls, we found differences in sprint 20m ($p \leq 0.008$), arrowhead agility test for both genders (boys: $p \leq 0.003$; girls: $p \leq 0.0061$), horizontal jumping ability for boys ($p \leq 0.000$) and girls in postural balance test on the left leg ($p \leq 0.048$). After 14 weeks, recreational football had significantly positive effects on body composition and motor abilities compared to initial results. The recreational football program led to improvements in physical fitness and body composition among schoolchildren.

Keywords: Motor abilities, physical activities, grassroots program.

Application of Software for Measurement of Coordination in a Virtual Environment

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Abstract: Introduction: Virtual environments offer new opportunities for assessing coordination and reaction in dynamic conditions. The aim of this study is to analyze the capabilities of the Reflexion GO software for measuring coordination in real-time and to collect both quantitative and qualitative data. Methodology: Methods for evaluating accuracy, reaction time, and coordination were employed using the Reflexion GO software. Additionally, interviews and observations with participants were conducted to gather qualitative data on their perceptions and experiences during the measurement process. Analysis: The data from the software were analyzed statistically, exploring correlations between different measurements of coordination and reaction time. The qualitative data were classified and assessed in terms of perceived difficulty and the effectiveness of the training. Results: The results indicate that the use of Reflexion GO provides accurate measurements of coordination and reaction time. Participants reported improvements in reaction speed and better awareness of movement, but also noted challenges in adapting to the virtual environment. Discussion: The results demonstrate the potential of Reflexion GO for assessing coordination in virtual settings, highlighting the importance of user adaptation to the technology. The need for further research to optimize virtual training environments remains significant.

Keywords: Virtual environment, coordination, reaction time, performance evaluation.

Differences in dimensions of competitive anxiety in football players of various biological acceleration

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Abstract: The study aimed to determine differences in competitive anxiety among football players of various biological development acceleration and different levels of playing g experience. The study included 104 male players in the older pioneers age category from six Croatian football clubs. The study used a Competitive State Anxiety Inventory-2 (shortened version) questionnaire. Descriptive statistics were applied to analyse all variables while group differences were assessed using the Kruskal-Wallis test and the Mann-Whitney U test. The findings did not confirm the hypothesis that boys with accelerated biological development show greater psychological stability leading to enhanced sports performance. Athletic success or failure could be explained by an athlete's psychological status rather than physical maturation. Therefore, mentally strong athletes can manage anxiety effectively, using it to improve their athletic performance. The results suggest that psychological development takes time and does not necessarily improve at the same rate as physical growth. is obviously needed and accelerated physical development does not mean the acceleration of mental development. Experience is a more significant factor in mental stability than the biological acceleration of physical development.

Keywords: Adolescents, development, psychology, team sport.

Pedagogical practices and communication when working with students with special educational needs

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Abstract: This study focuses on the pedagogical practices and communication strategies used by teachers when working with students with special educational needs (SEN), aiming to analyze their pedagogical activity. The research was conducted through an online survey that included questions tailored to the specifics of teachers' activities and interactions with students with special educational needs (SEN). The survey covered topics such as inclusive educational practices, the impact of education, support for student success, levels of engagement and attitudes, as well as teacher training. 433 teachers from Bulgaria participated in the study, 316 of whom are physical education (PE) teachers. The data analysis aims to reveal the specifics of their work and to assess the extent to which certain demographic characteristics such as gender, age, location, teaching experience, and training influence teachers' activities. A comparative analysis was performed using the nonparametric statistical test Mann-Whitney to determine the presence of statistical significance in observed differences. In conclusion, although a significant percentage of teachers work with students with SEN (83.1% of those surveyed), specialized training for working with this group of students is insufficient. The majority of respondents (98.4%) believe that pedagogical specialists should undergo specialized training to effectively work with students with special educational needs (SEN). The study provides valuable information for improving pedagogical practices and communication strategies when working with students with SEN, emphasizing the need for broader and more in-depth teacher training.

Keywords: Inclusive education, disabilities, pe teachers, attitudes.

The impact of resuming physical education classes on the physical capacity of school-aged girls in the post-pandemic context

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Abstract: The resumption of physical education classes in schools, following the restrictions imposed by the COVID-19 pandemic, represents a pivotal moment for restoring physical activity levels among school-aged girls and evaluating the impact of these activities on their overall physical fitness and well-being. The extended period of inactivity during the pandemic has significantly affected the motor and physiological development of many students, highlighting the importance of reintroducing structured physical education into the school environment. This research aims to evaluate the effects of resuming physical education programs on the general physical fitness of school-aged girls in a post-pandemic context. It is hypothesized that consistent participation in physical education classes, following the disruption caused by the COVID-19 pandemic, leads to significant improvements in physical capacity, as reflected in standardized motor and physiological test scores, including the Ruffier, Robinson, and ICE tests. Methodology: The study involved an experimental group of school-aged girls who participated regularly in physical education classes over a set period. Their progress was assessed through a comparative analysis of initial and final test results. Results: The girls in the experimental group showed notable improvements in all tested areas. The ICE test values increased significantly ($p < 0.001$), while Ruffier and Robinson scores reflected enhanced cardiorespiratory capacity and exercise tolerance. Compared to the control group, the experimental group demonstrated consistent improvement in both motor skills and physiological parameters. Conclusion: These findings emphasize the essential role of physical education in promoting the physical development and overall health of school-aged girls. The study supports the continued inclusion of physical education in the school curriculum, especially after periods of reduced activity, to foster long-term physical competence and well-being.

Keywords: COVID-19 pandemic, physical activity, school-aged girls, physical education classes.

Beijing 2022 Winter Olympics: A multi-dimensional analysis of impact and legacy

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Abstract: The 24th Winter Olympic Games in Beijing 2022 were a significant event in the history of China, as Beijing became the first city to host both the Summer (2008) and Winter (2022) Olympic Games. This significant sporting event served to showcase China's organisational capabilities and technological advancements, whilst also providing a substantial economic boost to winter sports and the regional economy. The utilisation of a SWOT (used to identify strengths, weaknesses, opportunities, and threats) model offers a systematic framework for the effective analysis of such large-scale events. The PESTEL model (Political, Economic, Social, Technological, Environmental, Legal) is a marketing tool of significant value when analysing the Beijing 2022 Winter Olympic Games. It facilitates comprehension of the impact that external factors exert on the organisation, conduct, and outcomes of this significant international sporting event. It is evident that the Beijing 2022 Winter Olympics have exerted a profound influence on China's economy, social structure, and technological development. Beijing's distinction as the first city to host both the Summer and Winter Olympics has necessitated substantial investments aimed at showcasing its technological prowess, catalysing economic growth, and fostering social transformation. A comprehensive PESTEL and SWOT analysis underscores the role of both external and internal factors in shaping the Beijing 2022 Winter Olympics, thereby propelling economic growth, technological innovation, and the enhancement of international relations.

Keywords: Olympics, impact, SWOT, PESTEL, COVID-19.

Sports development in the Commonwealth of Independent States (CIS) with the use of various activities effectiveness measure

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Abstract: The purpose of the study is to identify promising areas to improve the resource provision of sports in the regions of CIS. To achieve this goal, the following research methods were used: the analysis of special scientific and methodological literature, the study of directive documents and statistical materials (forms 1-FE, 3-AFE and 5-FE), the methods of observation, expert assessments and rating, the methods of sports development effectiveness evaluating, the methods of strategic planning (SWOT analysis) and the DEA method, the methods of mathematical and statistical processing of results. The study gives the concepts of sports activities effectiveness measure, the effectivity of sports activities, the effectiveness of physical education personnel, the sports facilities effective usage, the effectiveness of sports financing. We have determined the relationship between the characteristics of the sports activities effectivity, the effectiveness of the implementation of human, material, technical and financial resources of the subjects of the CIS at different levels of sports development: sufficient (provides a social effect), promising (consolidates the results of positive development), requiring modernization (obliges to change significantly the development process). As the level of sports development increases, the composition of criteria and evaluation characteristics, their significance and the values of parameters, an increase in the number of reliable relationships between the analyzed indicators change. The structure of interrelations of qualitative indicators of sports development in the subjects of the CIS at different levels of development differs significantly, therefore, while choosing management decisions, it is necessary to take into account the level of sports development at which the subject of the federation is located. The optimal values of criteria and evaluation indicators of sports development in the subjects of the CIS for the period 2022-2023 have been determined.

Keywords: Effective development, sport, efficiency, productivity.

Designing and testing an assessment tool for physical literacy in Southeastern European schools

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Abstract: Aim: The aim of this study was to develop and validate a Physical Literacy (PL) model designed for school settings in three Southeastern European countries: Serbia, Bosnia and Herzegovina, and Croatia. Also, the goal was to design and empirically test an instrument to assess the PL levels of students in these regions. Methods: First, a PL model and assessment tool were developed through a theoretical analysis of existing literature. Then, empirical research was conducted using the assessment tool on a sample of 719 students aged 12 to 14. Exploratory (EFA) and confirmatory (CFA) factor analyses were conducted to evaluate the structure of proposed model and validity of assessment tool. Results: Through a theoretical analysis of the literature, a three-dimensional model of PL was created, consisting of the affective, physical, and cognitive domains. EFA identified four factors: motor competence, physical fitness, motivation and physical self-efficacy, and knowledge and understanding. CFA was used to analyze both the three-dimensional theoretical model and the model derived from EFA. The results of CFA showed that the model emerging from EFA has an adequate fit, unlike the theoretical model. Conclusion: The results indicate that the proposed assessment tool demonstrates good construct validity and provides a valuable framework for understanding PL as a multidimensional construct in school environments. This assessment tool will also assist physical education teachers in monitoring and further developing children's skills, motivation, and self-efficacy, thereby creating the foundation for lifelong engagement in physical activities.

Keywords: Physical literacy, assessment tool, school environments, affective domain, construct validity.

Definition and assessment of proprioception: a literature review

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Abstract: This study is a part of PhD thesis and proposes to review the specialized literature on the definition and evaluation of proprioception. Method: Data selection, collection, and analyses followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement. Search Strategy and Data Sources from three international databases (PubMed, Scopus, and Web of Science). In each database, a search was conducted considering a predefined combination of keywords. Results: A total of 9268 records (1649 from PubMed; 2825 from Scopus; 4762 from Web of Science; and 32 from other sources) were identified. After removing duplicates (n=6,372), 2,896 records were screened based on title and abstract. A total of 284 records were assessed for eligibility by full-text reads. Finally, 176 articles matched all inclusion criteria and were included in the qualitative synthesis. Conclusion: The first definition of proprioception was published in 1906 by Charles Scott Sherrington, in a compendium of ten of Sherrington's Silliman lectures. Proprioception, described in specialized literature as the "sixth sense" is also called kinesthesia (or kinesthesia), a term introduced in 1887 by Henry Bastian, a term derived from two Greek words "kinein" (movement) and "aesthesis" (sensation). To perform functional movements in daily activities, physical and sports education, performance sports, in motor activities in free time, as in medical recovery, proprioceptive sense information of different mechanoreceptors is collected. Most researchers who have studied this aspect recognize the centrality of proprioception sense to understanding human movement and, for example, there is ample research demonstrating that significant processing of proprioception sense can play a critical role in performance sport.

Keywords: Definition, proprioception, kinesthesia.

Tuvan competitive game "DASH KODURERI"

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Abstract: In the presented article, we consider a competition, which is an organized sports competition for the championship in some professional or national sport. The competition in lifting special heavy stones in the Tuvan people is called Dash kodureri, it was a favorite type of physical exercise for travelers and it is mentioned in legends. Dash Kodureri is a traditional Tuvan game that represents a unique combination of strategy, strength and agility. The game Dash Kodureri has deep roots in the cultural tradition of Tuva, dating back to ancient times. Historical sources note that its origins are in the Naadim ceremony, a festival that gathers local tribes to compete in various sports, including stone throwing, wrestling, and, of course, dash kodureri [1]. Over the centuries, this game has become not only an entertainment, but also a way to transmit and preserve the cultural traditions of the people. The importance of Dash Kodureri can be assessed through his connections with folk games and customs of Tuvans. Such tournaments are not just competitions, they served as a platform to strengthen social ties and transfer knowledge about traditions. This article explores the historical roots and cultural significance of the game, its relevance in modern society, as well as its practical application as a means of developing physical, technical, intellectual and social skills. The article discusses the basic rules of the game, its goals and objectives, as well as information about championships and outstanding players who have achieved success in this discipline. It is especially important to note how the game contributes to the preservation of Tuvan traditions and their popularization outside the region. This makes Dash Kodureri significant not only for the Tuvan people, but also for the entire cultural heritage of the republic but also for the entire cultural heritage of Russia.

Keywords: Competition, competition, game, goal, objectives, strength, tradition, region, culture, art, custom, sport, wrestling, society, skill.

The evolution of women's Olympic fencing from Paris, 1924 to Paris, 2024

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Abstract: This article examines the development of competitive fencing, focusing on the evolution of women's participation in this traditionally male-dominated sport. Tracing the transformation from dueling practices to organized competitions in the early 20th century, the study notes the early inclusion of women's individual foil in the Olympic program in 1924, preceding many other sports and sports disciplines considered feminine or more popular among women. Interestingly, the other two weapons were included in the Olympic program for women at a later stage – the epee in 1996 and the sabre only in 2004. The article also examines the increase in the number of women's competitive events at the Olympic Games, with the inclusion of the team foil in 1960. In the period between the two world wars, the dominance of France, Italy, and Hungary was evident. With “mapping”, we aim to trace the “geography of glory,” specifically in the development of women’s fencing. We will analyze female participation by examining the number of competitors, and assessing gender equality. We will also consider the countries represented over the years and the age characteristics of the athletes who won quotas and took part in the competition program. This analysis aims to establish the state of women’s fencing on a global scale. The research methodology is based on quantitative and qualitative analysis of official data from the International Fencing Federation (FIE) and the IOC. The data were processed using descriptive statistics to describe the main characteristics of the sample and comparative analysis by country. This methodological approach aims to identify trends in women’s participation and success at the Olympic Games, as well as to track changes in the performance of different countries and the age characteristics of elite female competitors.

Keywords: Olympic games, gender equality, geography of success, participation analysis.