

## Cardiac cycle oscillatory dynamics in a self-paced precision task

Gallicchio, Germano; Ryu, Donghyun; Pecunioso, Alessandra; Jackson, Robin

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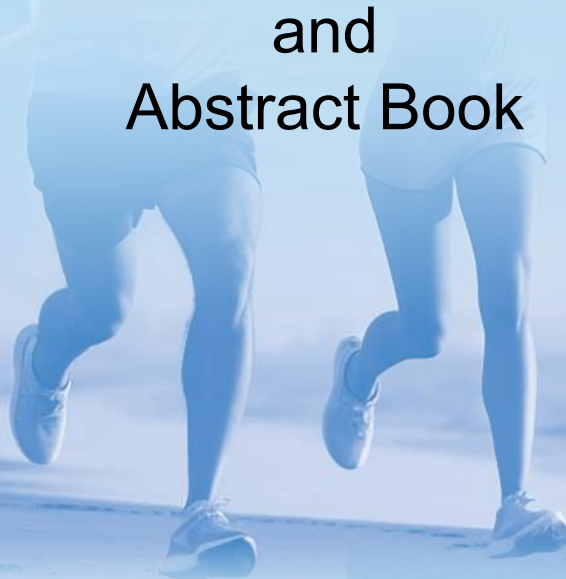
**14<sup>th</sup> Asia Conference on  
Kinesiology and Sport Science**  
**ACKSS**

**10<sup>th</sup> International Conference on  
Movement, Health and Exercise (MoHE)**  
MALAYSIAN JOURNAL OF  
**MOVEMENT**  
HEALTH & EXERCISE

**THE FUTURE OF HEALTH, FITNESS AND PERFORMANCE:  
INTEGRATION OF EDUCATION, TRAINING, TECHNOLOGY & INDUSTRY**

**10-12 September 2024**  
**Dorsett Grand Subang, Selangor, Malaysia**

**Programme Book  
and  
Abstract Book**



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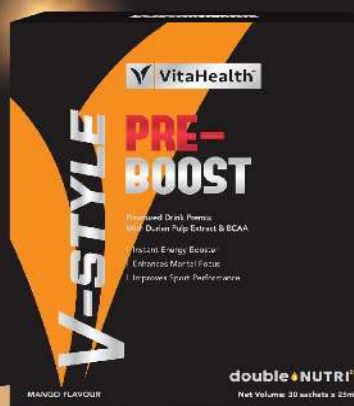
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CONFERENCE VENUE:  
Dorsett Grand Subang,  
Selangor

CONFERENCE DATE:  
10-12 September

PRE-CONFERENCE WORKSHOP:  
9 September

MAIN ORGANISERS:  
TAR UMT  
MANAGEMENT AND TECHNOLOGY

MINISTRY OF HIGHER EDUCATION

ASK  
Asian Society of Kinesiology

## Welcoming Message from the Advisor



Dear Colleagues

We are delighted to invite you to the "10th International Conference on Movement, Health and Exercise (MoHE) & 14<sup>th</sup> Asia Conference on Kinesiology and Sport Science" (ACK MoHE 2024), which will take place at Dorsett Grand Subang, Selangor, Malaysia, from September 10-12, 2024.

The conference will feature a comprehensive three-day scientific program, along with a pre-conference workshop on September 11, 2024, under the theme "The Future of Health, Fitness, and Performance: Integration of Education, Training, Technology & Industry."

In addition to lectures by esteemed international experts, we have organized several sessions focused on the latest innovations and developments in the field. With cutting-edge presentations and poster sessions, we anticipate a highly enriching experience for all attendees.

This conference offers an excellent opportunity to exchange knowledge, reconnect with colleagues, and enjoy the welcoming atmosphere of Selangor, Malaysia. We look forward to seeing you there from September 10-12, 2024.

Professor Dr Loke Chui Fung  
Vice President, TAR UMT, Advisor of the 10<sup>th</sup> International Conference On Movement, Health and Exercise (MoHE) & 14<sup>th</sup> Asia Conference on Kinesiology and Sport Science





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**10<sup>th</sup> International Conference on Movement, Health and Exercise (MoHE)**

**ASK**  
Asian Society of Kinesiology

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TARUMT  
UNIVERSITI TEKNOLOGI MALAYSIA  
MINISTRY OF HIGHER EDUCATION  
Asian Society of Kinesiology

## Welcoming Message from the Chairperson



Dear Colleagues,

On behalf of the organizing committee of the "10<sup>th</sup> International Conference on Movement, Health and Exercise (MoHE) & 14<sup>th</sup> Asia Conference on Kinesiology and Sport Science," it is my pleasure to invite you to join us at ACK MoHE 2024, taking place from September 10-12, 2024, in Selangor, Malaysia, also known as The Golden State.

With the theme "The Future of Health, Fitness, and Performance: Integration of Education, Training, Technology & Industry," this conference will serve as a platform for educators, practitioners, and scientists worldwide to engage with pioneers and leaders in the field. Together, we will share knowledge, research findings, and the latest innovations in sports science. This is an opportunity for us to reflect on past and present developments as we shape the future of our field.

We believe ACK MOHE 2024 will leave a lasting impact, addressing global challenges in sports science education and fostering an enhanced learning and teaching environment for both educators and students.

We warmly welcome you, your family, and your colleagues to ACK MoHE 2024. We hope you find the conference both enriching and enjoyable. Thank you in advance for your participation and contributions to the success of this event.

Associate Professor Dr Tan Hui Yin

Chairperson of the 10<sup>th</sup> International Conference On Movement, Health and Exercise (MoHE) & 14<sup>th</sup> Asia Conference on Kinesiology and Sport Science



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## Welcoming Message from the President of Asian Society of Kinesiology (ASK)



Dear Colleagues and Participants,

One year has passed since last year's ASK2023 in Japan via online mode. I am excited about the physical conference, ASK 2024, to be held in Kuala Lumpur, the capital city of Malaysia. I would like to express my appreciation of the efforts of Team TAR UMT in helping to organize this conference. The conference will be held between 10<sup>th</sup> -12<sup>th</sup> September 2024, and I am confident that the conference will be a catalyst for further growth of ASK. Although I will not be able to attend due to official duties, I would like to offer my greetings to the participants here and I wish all a successful ASK2024 and MoHE.

Shumpei Miyakawa

President, Asian Society of Kinesiology





## Table of Contents

<b>Welcome Messages.....</b>	<b>I</b>
<b>Table of Contents.....</b>	<b>IV</b>
<b>Organizing Committee.....</b>	<b>V</b>
<b>Scientific Committee.....</b>	<b>VI</b>
<b>Keynote Lectures .....</b>	<b>1</b>
<b>Special Lectures .....</b>	<b>4</b>
<b>Special Session.....</b>	<b>8</b>
<b>Thematic Plenary Speakers (Theme 1-4).....</b>	<b>9</b>
<b>Programme Schedule.....</b>	<b>11</b>
<b>Abstracts.....</b>	<b>33</b>
<b>Sponsors.....</b>	<b>102</b>

## Organizing Committee

<b>Patron</b>	YB. Dato' Seri Diraja Dr. Zambry Abdul Kadir Minister of Higher Education Ministry of Higher Education Malaysia
<b>Advisor</b>	Prof. Dr. Loke Chui Fung, (Vice President; TAR UMT)
<b>Co-Advisor</b>	YBhg. Dr. Hanafiah bin Ayub (Deputy Undersecretary, Sports Section, Strategic Planning Division, Ministry of Higher Education Malaysia)
<b>Chairperson</b>	Associate Prof. Dr. Tan Hui Yin
<b>Secretary</b>	Mr Phua Xin Hung
<b>Finance</b>	Mr Moses Ooi Cheng Chye
<b>Secretariat</b>	Associate Prof. Dr. Ler Hui Yin, Dr. Chan Kai Quin, Dr. Angelina Tan Li San & Ms Puah Hoay Way
<b>Sponsorship &amp; Tour</b>	Dr. Ng Kim Hooi, Dr. Ong Yien Yien, Ms Cynthia Anne Cornelius & Ms Juliana Binti Johan John
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<b>Physical Arrangement</b>	Ts. Choo Shyh Chin
<b>Press/Publicity</b>	Dr. Chen @ Chong Sheau Huey, Ms Wee Fooi Koon



## Scientific Committee

<b>Chairperson</b>	Assoc. Prof. Dr. Kok Lian Yee, Tunku Abdul Rahman University of Management and Technology (TAR UMT)
<b>MoHe Members</b>	Assoc. Prof. Dr. Ahmad Munir Che Muhamed, Universiti Sains Malaysia (USM) Assoc. Prof. Dr. Zainal Abidin Zainuddin, Universiti Teknologi Malaysia (UTM) Assoc. Prof. Dr. Nik Shanita Safii, Universiti Kebangsaan Malaysia (UKM) Assoc. Prof. Dr. Raja Mohammed Firhad Raja Azidin, Universiti Teknologi (UiTM) Assoc. Prof. Dr. Mohamad Shariff A Hamid, University Malaya (UM) Assoc. Prof. Dr. Roosfa Hashim, International Islamic University Malaysia (UIA) Dr. Mohd Hasnun Arif Hassan, Universiti Malaysia Pahang (UMP) Dr. Nor Farah Mohamad Fauzi, Universiti Kebangsaan Malaysia (UKM)
<b>TAR UMT members</b>	Assoc. Prof. Dr. Ler Hui Yin Dr. Chan Kai Quin Associate Prof. Dr. Kee Kang Mea Dr. Angelina Tan Li San Assoc. Prof. Dr. Ong Tah Fatt
<b>Other Institutions</b>	Prof. Dr Wee Eng Hoe, <i>SEGi University, Malaysia</i> Dr. Thung Jin Seng, <i>National Sports Institute Malaysia</i> Dr. Woo Mei Teng, <i>School of Sports, Health and Leisure, Republic Polytechnic, Singapore</i> Dr. Eliza binti Hafiz, <i>University Malaya (UM)</i> Assoc. Prof. Dr. Koh Koon Teck, <i>Nanyang Technological University - NTU Singapore</i> Assoc. Prof. Dr. Garry Kuan Pei Ern, <i>Universiti Sains Malaysia (USM)</i> Dr Alston Chong Wai Kong, <i>University Malaya (UM)</i>



## Keynote Lectures



### **Aerodynamic Characteristics of Sports Ballas and the Vortex Structures Generating Them**

**Professor Takeshi** | <sup>1</sup>Faculty of Health and Sport Sciences, University of Tsukuba,  
<sup>2</sup>Faculty of Physical Education, International Pacific University, Japan

In the field of sports science and technology, Prof. Takeshi engages in a wide range of activities including international research projects and serving as an instructor at national coaching seminars, working tirelessly to promote and develop sports science and technology. Through collaborative research with sports-related companies, he has conducted numerous studies and development projects on sports balls, sports shoes, and sportswear, successfully implementing these innovations in competitive settings. In this presentation, he would outline the fundamental aerodynamic characteristics of sports balls, focusing primarily on soccer balls. He would also discuss the vortex structures that produce these characteristics, as well as how sports techniques that utilize these principles can enhance performance.



### **Wearable technologies for real-time monitoring to protect health and enhance athletic performance in international triathlon**

**Dr. Carl James** | Department of Sport, Physical Education and Health  
 Hongkong Baptist University, Hong Kong

Despite advancements in heat mitigation strategies for athletes, heat-related illnesses continue to pose a major risk to athletes' health, particularly in endurance sports. Expert groups and international sporting federations now advocate for athletes' routine monitoring during elite competitions, to ensure their safety. This presentation will introduce an ongoing project to develop and monitor data such as core temp, skin temp, HR, and running biomechanics during endurance races. The long-term aim of the project is to use technology to provide an early warning system that can identify high-risk individuals during competitions in the heat. Beyond live medical monitoring, these data have wide-ranging applications in terms of supporting athlete performance and enhancing live broadcasts and fan engagement.



**Sport Technology and Strength and Conditioning Integration for Injury Resistance, Rehabilitation and Performance**

**Professor John Cronin** | SPRINZ, School of Sport and Recreation, Faculty of Health and Environmental Sciences, Auckland University of Technology, New Zealand

Prof. John Cronin is a renowned Professor in Strength and Conditioning at the Sports Performance Research Institute of New Zealand (SPRINZ) at AUT University. His research focuses on muscle strengthening for injury prevention and high-performance sports, with a particular interest in resistance training methods and sports technology.

Prof. John is committed to enhancing research capabilities within SPRINZ and is known for his influential work in youth athlete development and high-performance sports.



Understanding the body's abilities and improving exercise routines drive enhanced strength and conditioning and/or physiotherapy practices. Integrating sports technology needs to consider factors like cost and return on investment. Simple and cost-effective technologies like strain gauges, can provide better information for your isometrics, and elastic-based resistance training in early-stage rehab. For late-stage rehab and athletes returning to play, a testing battery that includes a change of direction (COD) is typically used. However, measuring COD as a total time has limited diagnostic value, and integrating foot pod technology may provide more granular information about return to play status or player weakness. Flywheel technology is unique in its ability to adjust to the user's physiological status and is well-suited for use with the injured and non-injured. It's also known for providing eccentric overload and plays an important role in sports performance, especially in optimizing eccentric braking/deceleration capability.



## Optimising Recovery for Athletes



**Professor Rob Duffield, Ph.D.** | <sup>1</sup>School of Sport, Exercise and Rehabilitation, University of Technology Sydney, Australia, <sup>2</sup>Football Australia

Professor Rob Duffield is a Professor of Sport & Exercise Science at the University of Technology Sydney, Australia. His research focuses on optimal performance and health outcomes in various environments, populations, and sports, including fatigue, recovery, exercise in the heat, cooling techniques, travel, sleep, injury factors, and training techniques. Additionally, Professor Duffield serves as the Head of Research & Development for Football Australia, providing support to the medical and performance practitioners working with the national teams. Don't miss these sessions at our conference!

The prescription of both high volume and quality of training load is fundamental to drive adaptation and ensure performance optimization for athletes. However, appropriate and sufficient recovery is also critical to optimize the ability to tolerate the training and match loads, ensure appropriate adaptation, and prepare for ensuing demands. Given the diversity of recovery interventions and options available to athletes, decisions on when and how to recover are seemingly more convoluted than ever. Accordingly, this presentation will discuss the role of primary drivers of recovery, including load, sleep, and nutrition, as well as popular interventions like water immersion and compression. It will also explore circumstances potentially negating recovery, such as travel and fixture congestion, with a focus on football and professional and semi-professional sports contexts.



## Special Lectures



### **Novel and Creative Approach to Preventing and Correcting Postural Abnormalities in Children: Utilizing Posture Correction VR-Based Games**

**Professor Dr. Reza Rajabi** | Faculty of Sport Sciences and Health, University of Tehran, Iran

Dr. Reza Rajabi, a Professor at the University of Tehran, will take you through integrating technology into training programs for Musculoskeletal Health. Dr. Reza's career in physical education has allowed him to work with students of various ages in the field of physical education and related organizations across Iran.



Dr. Reza Rajabi is renowned as the pioneering figure behind corrective motor games aimed at enhancing postural improvement among children. Notably, he has embarked on a cutting-edge endeavor by innovatively transforming corrective motor games into virtual reality (VR) based interventions. Spearheading research initiatives, he is actively engaged in the development and testing of VR-based corrective games designed to prevent or improve postural disorders, particularly among children. His forthcoming presentation

promises to deliver valuable insights into this pioneering approach and its potential to revolutionize postural health management in the younger population.



## Teaching Sports with Situated Game Scenarios

Professor Dr. Fatih Dervent | Faculty of Sport Science, Marmara University, Türkiye

Dr. Fatih Dervent is a Professor of Physical Education Teacher Education at Marmara University in Istanbul, Turkey. He is the vice president of the Physical Education Teachers Association of Turkey (TUBED) and conducts research on instructional interventions to improve physical education teaching.

Dr. Fatih Dervent will present his research discovery on the effectiveness of an innovative game model that integrates technology into training programs for Health and Performance. Sport-specific skill teaching mostly depends on technique-focused approaches, limiting learning transfer between practice and real life. One way to improve players' game competence is to put them in a real game situation to make relational analyses between game parameters. Situated Game Teaching through Set Plays (SGTSP) emphasizes situational and relational aspects of games. It aims to develop players' game performance and decision-making ability.



### Situated Learning

The social and cultural contexts where learning occurs significantly influence and shape what is learned and how learning takes place.



## Sports where Taiwan excels at the Olympics

**Professor Dr. Li-Shiue Gau** | Department of Leisure and Recreation Management, Asia University, Taiwan



Dr. Li-Shiue Gau, a Professor at Asia University in Taiwan, will present an insightful exploration of Taiwan's impressive achievements in the Olympic Games. Holding a PhD from Florida State University, Dr. Gau specializes in sport management with research interests that include the societal and life values associated with spectator sports, sports consumer behavior, and leisure studies. Using multiple perspectives, Dr. Gau's presentation will explore various factors contributing to Taiwan's Olympic success in sports such as weightlifting, taekwondo, archery, and badminton. This

lecture promises a comprehensive understanding of how Taiwan's sports achievements intersect with broader societal contexts. Additionally, it will discuss the wide-ranging impacts of these achievements on athletes' careers, public sports participation, and leisure activities with a focus on health and well-being.



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**Tele-Exercise: A New Approach to Overcome Obesity Problems among White Collar Workers**

**Dr. Mury Kuswari, S.Pd., M.Si.** | Nutrition Department, Faculty of Health Sciences, Universitas Esa Unggul, Indonesia

Dr. Mury Kuswari, S.Pd., M.Si, is an Assistant Professor in the Nutrition Study Program at Universitas Esa Unggul in Indonesia. Over the past decade, his research and publications have focused on wellness corporate programs aimed at addressing obesity among employees in various corporate, private, and government institutions in Indonesia. For the past five years, his research has specifically centered on tele-exercise and nutrition assistance methods. In Indonesia, he has spearheaded numerous tele-exercise programs to combat obesity among employees. Additionally, he has provided coaching for tele-exercises and served as the head nutrition consultant for Indonesian elite athletes at events such as the Sea Games, Asian Games, World Championships, and the Indonesian Olympic team.

Tele-exercise is a proven method to tackle the issue of obesity among white-collar workers. When done live with a qualified trainer and a tailored program, it can help reduce weight, improve body composition and lipid profile, and enhance fitness. Tele-exercise is highly effective in addressing the problem of worker obesity.





## SPECIAL SESSION



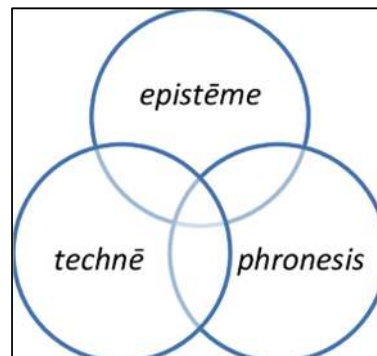
### The Necessity of Integrating Academic Names between Kinesiology and Sports Science

Dr. JeongHyo Kim | Seoul National University

**Dr. JeongHyo Kim** is a researcher and lecturer specializing in sport philosophy, ethics, and sport culture theory at Seoul National University. Dr. Kim's academic journey began with a doctorate in "Physicality in Modern Japanese and Novel Literature" from Tsukuba

University, Japan, awarded in 2005. Dr. Kim's passion for sports led him to delve into the ethical and philosophical aspects of athletic competition. His book, "Sports Ethics," first published in 2016, has become a foundational text for sports-related programs across South Korea, currently in its third edition (2024).

Our academic field which includes physical activity and sports does not yet have an internationally unified name. The mixture of names we currently use, such as physical education, sports, human movement, and physical activities, is not desirable for our academic identity. This presentation will philosophically discuss why a single name that encompasses both human movement and sports culture is necessary.



# Thematic Plenary-Theme 1 & 2

## Theme 1: Revolutionising Sport Technology for Optimising Performance



**Assoc Prof Dr Mohd Hasnun Arif Bin Hassan**

Faculty of Mechanical and Automotive Engineering Technology

Universiti Malaysia Pahang Al-Sultan Abdullah



**Assoc. Prof. Dr Chalpat Lawsrirat**

Faculty of Sport Science

Chulalongkorn University, Thailand



**Dr Woo Mei Teng**

Conexus Senior Manager

Experiential Learning Research Centre, Republic Polytechnic, Singapore



**Dr Alexander Ong**

Principal Lecturer,

Republic Polytechnic, Singapore



**Mr Moon Seok Chung**

Director Middle East & Asia

Education Program Leader

Dartfish SA, Switzerland

## Theme 2: Impact of Sport & Exercise Science on Athletes



**Assoc. Prof. Dr Ahmad Munir Che Muhamed**

Lifestyle Science Cluster, Advanced Medical and Dental Institute (AMD), Universiti Sains Malaysia, Malaysia



**Prof. Dr Hu Min**

Director of GD Key Lab of Physical Activity and Health Promotion

Guangzhou Sport University, China



**Assoc. Prof. Dr Govindasamy Balasekaran**

Physical Education and Sports Science, National Institute of Education, Nanyang Technological Singapore

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## Thematic Plenary-Theme 3 & 4

### Theme 3: Improving Pedagogical and Psychological Training Methods for Athletes



**Assoc. Prof. Dr Koh Koon Teck**  
Physical Education and Sports  
Science Academic Group  
National Institute of Education,  
Nanyang Technological University,  
Singapore



**Assoc. Prof. Dr Chow Jia Yi**  
Physical Education and Sports  
Science, National Institute of  
Education, Nanyang Technological  
University



**Assoc. Prof. Dr Garry Kuan Pei Ern**  
Exercise and Sports Science  
Programme,  
School of Health Sciences,  
Universiti Sains Malaysia, Malaysia.



**Prof. Dr Wee Eng Hoe**  
Faculty of Education, Language,  
Psychology and Music,  
SEGI University, Malaysia

### Theme 4: Enhancing Performance through Strength & Conditioning Practices



**Prof. Dr John Cronin**  
School of Sport and Recreation  
Faculty of Health and  
Environmental Sciences  
Auckland University of Technology  
New Zealand



**Mr. Jad Adrian Washif**  
Senior Strength & Conditioning  
Coach  
National Sports Institute of  
Malaysia



**Prof. Dr Nur Ikhwan bin  
Mohamad**  
Faculty of Sports Science and  
Coaching  
Sultan Idris Education University  
(UPSI), Malaysia



**Assoc. Prof. Dr Raja Mohammed  
Firhad Raja Azidin**  
Faculty of Sports Science and  
Recreation  
Universiti Teknologi MARA (UITM),  
Malaysia

# **Programme Schedule**



# 14th Asia Conference on Kinesiology and Sport Science & 10th International Conference on Movement, Health, and Exercise (MoHE)

DAY 1: September 10, 2024 (Tuesday)

Time	Selangor 1				
08:00-09:00	REGISTRATION				
09:00-09:30	OPENING CEREMONY				
09:30-10:30	<p align="center"><b>Keynote Lecture 1: Prof. Dr John Cronin (New Zealand)</b>                      Sport Technology and Strength and Conditioning Integration for Injury Resistance, Rehabilitation, and Performance  <i>Moderator: Assoc Prof Dr Kok Lian Yee</i></p>				
10:30-10:50	TEA BREAK				
10:50-12:35	<b>Melati 4</b>		<b>Selangor 1</b>		
	<p align="center"><b>Oral Presentation Session 1: EXERCISE SCIENCE</b>  <i>Moderator: Dr. Nor Farah Mohamad Fauzi</i></p>		<p align="center"><b>Thematic Symposium 1: REVOLUTIONISING SPORT TECHNOLOGY FOR OPTIMISING PERFORMANCE</b>  <i>Moderator: Assoc Prof Dr Issei Ogasawara</i></p>		
	ES016	Evaluating thermal strain levels of Japanese high-school KOSEN students during shuttle run tests as an alternative endurance running tests - <i>Miyo Yokota (Japan)</i>	<p>Computer Vision AI Technology in Sports Analysis - <i>Mr. Moon-Seok Chung (Switzerland)</i></p> <p>Finite Element Analysis Sports - <i>Assoc. Prof. Mohd Hasnun Arif Bin Hassan (Malaysia)</i></p> <p>Translating Practical Skills: Integrating Sports Video Analysis into Curriculum Design - <i>Dr. Woo Mei Teng (Singapore)</i></p> <p>Importance of trunk rotation for translating GRF to horizontal punch force among Thai Boxers - <i>Assoc. Prof. Dr. Chaipat Lawsirat (Thailand)</i></p> <p>Empowering the Next Generation: Data Science, Wearables &amp; Industry Projects for Health &amp; Sports Science Education - <i>Dr. Alexander Ong (Singapore)</i></p>	SM032	Reproducibility of the Dynamic Balance Assessment in Males and Females: A Longitudinal Study - <i>Mizuta Rami (Japan)</i>
	ES042	The Impact of Physical Exercise on Brain-Derived Neurotrophic Factor Levels: A Meta-Analysis Study - <i>Zheng YiKun (China)</i>		SM066	The efficacy of BCAAs supplementation on the rate of force development in different time intervals: a randomized, crossover, double-blind, placebo-controlled study - <i>Zhang XiNuan (China)</i>
	ES134	Analysis of Competitive Performance Characteristics of Top Male Jumpers in the World - <i>Wu YaLin (China)</i>		SM067	The Relationship between Sarcopenia, Physical Activity, and Cognitive Function among Community-Dwelling Older Adults in Malaysia - <i>Lee Ann Kee (Malaysia)</i>
	ES072	Effect of aerobic exercise combined with probiotics on skeletal muscle glucose metabolism through AMPK/Rab5/GLUT4 pathway in T2DM rats - <i>Zhang YiFan (China)</i>		SM110	Blood Flow Restriction Combined with Calf Eccentric Training Induces Post-activation potentiation and Improves Jump Performance - <i>Fan Wenxuan (China)</i>
	ES079	Analysis of the effect of Otago exercise program combined with Baduanjin on the balance ability of middle-aged and elderly women - <i>Cai CaiHua (China)</i>		SM112	Challenges and Innovations in Hypoxia Training Research: A Multidimensional Analysis - <i>Xu Wanqun (China)</i>
	ES207	Harnessing The Power of Aerobic and Resistance Exercise: A Neuroprotective Strategy Against AICl3-Induced Neurodegeneration in Rats - <i>Muhammad Hafiz Zuhdi (Malaysia)</i>		SM184	Functional Recovery in Stroke Patients Under Rehabilitation Treatment Intervention is Affected By Glenohumeral Subluxation - <i>Li Le (Malaysia)</i>
	ES050	Badminton Fatigue Protocol Based On Time-Motion Patterns of Elite Finalist - <i>Edin Kardin Suwarganda (Malaysia)</i>		SM221	Comparison of the effects of sports dance and traditional Chinese medicine exercises on the physical and mental qualities of college students in community groups - <i>Zhao Peng (China)</i>
	ES068	Profiling Balance Across Multiple Malaysian Skill Sports - <i>Yallini Selva (Malaysia)</i>			
12:30-14:05	LUNCH				

**14th Asia Conference on Kinesiology and Sport Science & 10th International Conference on Movement, Health, and Exercise (MoHE)**

**DAY 1: September 10, 2024 (Tuesday)**

Time	THE DOME			
	Poster Presentation			
<b>11:20 - 12:25</b>	BT006	Mechanical Asymmetries Remain Low-To-Moderate During 30 Minutes Of Self-Paced Treadmill Running - <i>Khouloud Mtibaa (Qatar)</i>	BT010	Enhancing Curling Performance: Strength and Stability Training for the Forward Sliding Technique - <i>Hua Xing Zhang (Malaysia)</i>
	BT0124	An Analysis of the Kinetics of the Tango Walk for College Dance Students - <i>Qian Xinghao (China)</i>	BT0178	Assessing the Influence of Foot Arch and Running Shoe Design on Running Impact Forces: A Regression Analysis - <i>Zheng Pengfei (China)</i>
	BT0198	The Influence of Light-Triggered Reaction Time Rapid Walking on the Stability of Gait Initiation in the Elderly - <i>Xiangdong Wang (China)</i>	BT0210	Study on Plantar Pressure Distribution Characteristics of Bare Foot Running and Shoe Running - <i>Zongxiang Hu (China)</i>
	ES004	The effects of different types of whole-body vibration intervention on static balance for children with developmental coordination disorder - <i>Fu-Chen Chen (Taiwan)</i>	ES014	A Cultural Impact on Team Snacks in Youth Sports - <i>Nanita L Hopoate (United States)</i>
	ES030	Upper Limb Stretch Reflex Dynamics in Judo Athletes - <i>Sho Ito (Japan)</i>	ES091	Effects of an 8-Week Mobile-Based Walking Program on Depression, Perceived Stress, and Affectivity in College Students - <i>Ye Hoon Lee (Korea)</i>
	ES094	Effect of aerobic exercise combined with resistance training on limb blood pressure and arterial stiffness in obese and overweight adults - <i>Yaohui Wu (China)</i>	ES105	Analyzing the Winning Indicators of Chinese Women's Professional Basketball League Based on Machine Learning Models - <i>Yuan Zhijie (China)</i>
	ES111	Effects of Plyometric Training on the Movement Speed among Youth Male Basketball Players - <i>SHAOSHEN WANG (Malaysia)</i>	ES191	Effects of Exergaming Intervention on Overweight and Obese Children with and without Parents Participations - <i>Teng Keen Khong (Malaysia)</i>
	ES133	The effect of Sprint Interval Training on Glucose and Lipid Metabolism - <i>Yadan Tan (China)</i>	ES209	Quantification of muscle oxygenation using near infrared spectroscopy (NRIS) in a Short Physical Performance Battery (SPPB) test for older adults: the community dance program (CPD) study. - <i>Zi Xiang Lim (Singapore)</i>
	ES192	Plyometric Training Effect on Vertical and Horizontal Power Development in Artistic Gymnast Under 12- Year-Old - <i>Ashril Yusof (Malaysia)</i>	MG026	Examining the Sports Values and Future Preferences of Korean Citizens - <i>Chanmin Park (Korea)</i>
	ES226	Effect of 8 weeks Combined Hypoxic and Normoxic Repeated-Sprint Training on Aerobic and Anaerobic Capacities among Male Netball Players - <i>Jet Ming See (Malaysia)</i>	MG140	Current Status of Talent Cultivation and Employment Development for Fitness Instructors in Taiwan - <i>I-Chih Chen (Taiwan)</i>

**14th Asia Conference on Kinesiology and Sport Science & 10th International Conference on Movement, Health, and Exercise (MoHE)**

**DAY 1: September 10, 2024 (Tuesday)**

Time	THE DOME			
	Poster Presentation			
<b>11:20 - 12:25</b>	MG117	Cultural Marketing Strategies in Sports Events - <i>Shi Jie-qi (China)</i>	PE162	Research on the Competency Model of Physical Education Teachers in Rural Primary and Secondary Schools in the New Era—Taking Zhaoqing City, Guangdong Province as an Example - <i>Jionglin Mo (China)</i>
	MG174	Spatiotemporal Characteristics and Influencing Factors of Online Attention to Outdoor Sports in China - <i>Yiheng Zhang (China)</i>	SC043	Theoretical Connotation, Obstructive Factors and Relief Paths for Developing High-Quality Sports Health Towns for the Aging Population - <i>Jiangtao Xia (China)</i>
	SC023	Analysis of the role of Chinese traditional sports culture on the development of modern social sports culture from the perspective of sociology - <i>JingMei Xu (China)</i>	SM033	Normative Reference Values and Predicting Factors of Sport-Related Concussion for Contact and Non-Contact Games among Sport Schools Athletes in Malaysia - <i>Noor Aien Monsarip (Malaysia)</i>
	SM056	The Effects of Balance Training with Stroboscopic Eyewear among Young Adults - <i>Yi-Wen Chen (Taiwan)</i>	SM060	The relationship between training load and injury in Japanese college American football players - <i>Boyuan Zhou (Japan)</i>
	SM065	Correlation Between Isokinetic Muscle Strength of Vastus Medial Oblique and Q Angle in Healthy Males - <i>Huai-Yao Chiu (Taiwan)</i>	SM129	A study on the effect of exercise intervention on blood factor FPG in myasthenia gravis population - <i>Zhou Weinan (China)</i>
		-	SM0166	Gender Differences in Vertical Jump Performance Among Elite Downhill Alpine Skiers - <i>Huang Yunfei (China)</i>
		-		-
<b>12:30- 14:05</b>	LUNCH			

# 14th Asia Conference on Kinesiology and Sport Science & 10th International Conference on Movement, Health, and Exercise (MoHE)

DAY 1: September 10, 2024 (Tuesday)

Time	Melati 4	Selangor 1	Melati 5	
	<b>Young Investigator Award (YIA) Session 2: EXERCISE SCIENCE</b>	<b>Thematic Symposium 2: IMPACT OF SPORT &amp; EXERCISE SCIENCE ON ATHLETES</b> <i>Moderator: Assoc Prof Dr Chan Kai Quin</i>	<b>Young Investigator Award (YIA) Session 3: ATHLETIC TRAINING AND SPORT BIOMECHANICS</b>	
<b>14:05 - 15:35</b>	ES011 Effects of High-Intensity Exercise on Blood and Liver Function Markers in Athletes: A Cross-Sectional Study - <i>Anshul Meena (India)</i>	<b>14:05 – 15:05</b>  Climate change and its challenges to athlete performance - <i>Assoc. Prof. Dr. Ahmad Munir Che Muhamed (Malaysia)</i>	AT034 Effects of Full Marathon Run on the Stiffness of Plantar Fascia and Iliotibial Band measured by ultrasound Shear Wave Elastography - <i>Lee Rou You (Malaysia)</i>	
	ES012 Single Session of Graded Treadmill Exercise Triggers the Increase of Lactate Dehydrogenase Levels in Athletes: A Cross-Sectional Study - <i>Pradeep Singh Chahar (India)</i>		AT143 Relationship Between the Medial Elbow Joint Space Gapping During Ball Grasping and the Cross-Sectional Area of Flexor Digitorum Superficialis and Flexor Carpi Ulnaris: an ultrasound-based study - <i>Ryosuke Kaizuka (Japan)</i>	
	ES017 The Reliability and Validity of the Cobb Method Using Dual-Energy X-ray Absorptiometry in Individuals with Idiopathic Scoliosis - <i>Tunyalux Wannakon (Thailand)</i>		Prediction of world, elite, sub-elite, and collegiate running performances utilizing Running Energy Reserve Index (RERI) model - <i>Assoc. Prof. Dr. Govindasamy Balasekaran (Singapore)</i>	AT185 Injury Survey of Japanese Electronic Sports Players Through Interviews - <i>Ryoya Takaue (Japan)</i>
	ES063 Effect of Fatgripz Resistance Training on Upper Body Strength and Grip Strength in Active Male Subjects - <i>Tiew Kee Aun (Malaysia)</i>			BT053 Informed Training with Shot Patterns of Elite Badminton Finalist - <i>Myheshwara Nagaswara (Malaysia)</i>
	ES071 Effect of 6 weeks Flywheel Eccentric Overload Training and Fast Eccentric Resistance Training on 1RM Back Squat Among Resistance Trained University Students. - <i>Lee Qi Yang (Malaysia)</i>	Translational Exercise Biomedicine - where do we go? - <i>Prof. Dr. Min Hu (China)</i>	BT204 Correlation between pivot-leg knee kinematics and kinetics during the stride phase in baseball pitching - <i>Lu Wei-Cheng (Taiwan)</i>	
	ES073 The Impact of Physical Exercise on Depression in Middle-aged and Elderly Hypertensive Individuals: An Analysis from the China Health and Retirement Longitudinal Study - <i>Li Jiayi (China)</i>	<b>15:05 – 15:35</b>  <b>Partner Insights:</b> Role of Supplements in Sports Nutrition - <i>Ms Lim Choong (Dietition, VitaHealth)</i>	BT205 The Effect of Dynamic Taping on Shoulder Kinematics and Ball Velocity in Baseball Pitching - <i>Chen Fang-Yuan (Taiwan)</i>	
	ES085 A Study on the Construction of Winning Technique Models for Elite Men's Basketball Teams: A Case Study of the Semifinalists in the 2023 FIBA Men's World Cup - <i>Deng Jiayi (China)</i>			
	ES132 Association Between Body Composition and Fitness Performance Among Malaysian Military Cadets - <i>Ebby Waqqash Mohamad Chan (Malaysia)</i>			
<b>15:35- 16:35</b>	<b>Keynote Lecture 2: Prof. Dr Takeshi Asai (Japan) – (Venue: SELANGOR 1)</b> Aerodynamic Characteristics of Sports Balls and the Vortex Structures Generating Them <b>Moderator: Assoc. Prof. Mohd Hasnun Arif Bin Hassan</b>			
<b>16:35- 16:55</b>	TEA BREAK			



# 14th Asia Conference on Kinesiology and Sport Science & 10th International Conference on Movement, Health, and Exercise (MoHE)

## DAY 1: September 10, 2024 (Tuesday)

Time	Melati 4	Selangor 1	Melati 5				
	<b>Oral Presentation Session 3: SPORT PEDAGOGY</b> <i>Moderator: Assoc Prof Dr Ong Tah Fatt</i>	<b>Oral Presentation Session 2: SPORT AND EXERCISE PSYCHOLOGY</b> <i>Moderator: Ms Cynthia Anne Cornelius</i>	<b>Oral Presentation Session 4: SPORT BIOMECHANICS AND TECHNOLOGY</b> <i>Moderator: Dr Woo Mei Teng</i>				
<b>16:55 - 18:30</b>	PE024	Effects of Strobe Image Feedback on Running Long Jump Performance in Physical Education Classes - <i>Akihiro Azuma (Japan)</i>	SP211	BT075	Cardiac Cycle Oscillatory Dynamics in A Self-Paced Precision Task - <i>Germano Gallicchio (United Kingdom)</i>	Fall Risk Prediction Model Based on Machine Learning Among Middle-Aged and Older Adults in rural China: Results from the China Health and Retirement Longitudinal Study - <i>Hao Wenqiang (China)</i>	
	PE087	Examining the Challenges and Benefits of Bilingual Physical Education under Taiwan's "2030 Bilingual Policy": Insights from Teachers in Taoyuan and New Taipei City - <i>Wu Ying-Chi (Taiwan)</i>	SP155				Affective responses during low volume high-intensity interval exercise in overweight-to-obese adults: a systematic review - <i>Zhang Ruohan (Malaysia)</i>
	SP168	A Study On The Effects Of Eomatosensory Interactive Game Intervention On Preschool Children's Perceptual-Motor Ability And Fundamental Movement Skills - <i>Xie Tian (China)</i>	SP031	BT093	TARGET Measures, Situational Motivation and Adherence in Physical Education among Trainee Teachers - <i>Chin Ngien Siong (Malaysia)</i>	The friction moment counteracts the ground reaction force driven tibial rotation moment at foot impact phase of cuttings. - <i>Issei Ogasawara (Japan)</i>	
	PE099	A Research on Constructing Functional Strength Training in the University Physical Educational System under the Background of Educational Innovation - <i>Jin Zheyu (China)</i>	SP054	BT160	Perception of Sarawakian Youth towards Physical Activity - <i>Malisa Haziqah Binti Mohammad Haffizie (Malaysia)</i>	Association between tennis court surface type and landing impact on the step - <i>Ito Ginji (Japan)</i>	
	PE142		SP055	BT070	Perceived Motivational Climate, Intrinsic and External Goals and Enjoyment of Freshman Trainee Teachers in Physical Education - <i>Michelle Melini Walter (Malaysia)</i>	A Biomechanical Analysis of the Kick Leg Action in Children's Ballroom Dancing - <i>Qian Xinghao (China)</i>	
	PE219	The Impact of Physical Activities on Enhancing Primary School Students' Academic Performance - <i>Zhang Andong (China)</i>	SP233	BT161	A Study on the Leisure Benefits, Work Stress, and Happiness of Middle-aged Working Women in Pingtung County - <i>Yang Yu-Chieh (Taiwan)</i>	Comparative analysis of on-field tactical behaviour in Malaysian Elite and State-level youth soccer players - <i>Asha Hasnimy Mohd Hashim (Malaysia)</i>	
	PE084	The influence of intervention inside and outside class on the health of obese female college students - <i>Guo XiYun (China)</i>	SP035	<b>18:00 -18:30</b>  ASK MC Meeting			
	PE084	The Impact of Game Sense Training Intervention on Basketball Players - <i>Li Qi-Jie (Taiwan)</i>	SP028				Fitness and Attitude Assessment of Elementary School Girls - <i>Lydia Wong Juan Ye (Malaysia)</i>
	SC170	Urban-Rural Differences in Adolescent Sports Participation and Its Impact on Physical and Mental Health: An Empirical Analysis Based on CGSS 2021 Data - <i>Yang Yi (China)</i>	SP208				Perception of Elementary School Pupils Expectancy Beliefs, Task Values and Anxiety in Physical Education - <i>Teo Boon Sian (Malaysia)</i>
					Validation of the Chinese Version of the Academic and Athletic Identity Scale (AAIS) Among university student-athletes - <i>Wang Xiawei (Malaysia)</i>		
<b>END OF DAY 1</b>							

**14th Asia Conference on Kinesiology and Sport Science & 10th International Conference on Movement, Health, and Exercise (MoHE)**

**DAY 2: September 11, 2024 (Wednesday)**

Time	Melati 4	Selangor 1	Melati 5		
08:00 - 10:00	<b>Young Investigator Award (YIA) Session 4: SPORT AND EXERCISE PSYCHOLOGY</b>		<b>Oral Presentation Session 5: SPORT MEDICINE AND ATHLETIC TRAINING Moderator: Mr Tiew Kee Aun</b>		
	SP040	Undergraduate-athletes' motivation and identity in academics and sports - <i>Clarriechel Walter Lakun (Malaysia)</i>	08:00 – 09:00  <b>Special Lectures 1: Prof Dr. Reza Rajabi (Iran)</b>  Novel and Creative Approach to Preventing and Correcting Postural Abnormalities in Children: Utilizing Posture Correction VR-Based Games	SM002	Does short-duration static stretching exercise affect dynamic balance in u-14 female athletes? - <i>Samiha Amara (Oman)</i>
	SP009	The Relationship between Learning Engagement and Peer Support among University Swimming Beginners: The Mediating Roles of Achievement Goal Orientation and Self-Efficacy - <i>Li Dongyu (China)</i>		SM036	Effects of 2-day Acute IHT and IHHT on Anaerobic Metabolism - <i>Chen Yi-Nung (Taiwan)</i>
	SP025	Development Path Model for Under- 17 Football Players in Indonesia and Malaysia: Insights from Sport Psychology - <i>Amin Akbar (Indonesia)</i>		SM078	Development of a Predictive Model for Frailty Risk in Healthy Older Adults Over 3 Years Using Machine Learning Algorithms: A Study from CHARLS - <i>Liu Lei (China)</i>
	SP027	Neurobiological Mechanisms Underlying Coordinated Actions in Joint Action - <i>Liu Ying (China)</i>		SM080	Research on Assessing Functional Defects and Predicting Injury Risks of College Street Dance Enthusiasts Based on YBT - A Case Study of Quanzhou Region - <i>Tong Yihan (China)</i>
	SP083	Gender differences in adolescent participation of football: A study based on the Theory of Planned Behavior - <i>Zeng Xiancheng (China)</i>	09:00 – 10:00  <b>Special Lecture 2: Prof. Dr. Fatih Dervent (Türkiye)</b>  Teaching Sports with Situated Game Scenarios	SM136	Is it appropriate to group the peroneus muscles (peroneus longus and peroneus brevis) together as the peroneus muscles? - <i>Urabe Yukio (Japan)</i>
	SP095	Elucidating The Mechanism of Carbonated Carbohydrate Mouth Rinsing During Prolonged Running Performance - <i>Muhammad Adi Asymawi Aminudin (Malaysia)</i>		SM165	The Advance of Research on Artistic Gymnastics - <i>Pang Ying (China)</i>
	SP120	An intervention study on the effect of positive thinking training on the learning of general tennis motor skills of physical education students - <i>Luo Lan (China)</i>		SM240	Effects of 3D Printed Lattice Structure Insoles Vs Solid Structure Insoles In Badminton Players With Achilles Tendinopathy - <i>Koushik K. V.S (India)</i>
	SP217	The Relationship between Social Support, Reinforcement and Physical Activity Behavior - <i>Selvendra Raj Retnabrabagaran (Malaysia)</i>	SM236	Predicting performance in badminton based on actn3 r/x and bdnf val66met gene polymorphisms - <i>Hazwani Ahmad Yusof (Malaysia)</i>	
SM235	The Immediate Effect of Aqua Bag Exercises on Postural Sway in University Students - <i>Yu-Wen Hung (Taiwan)</i>				
10:00-10:20	TEA BREAK				

**14th Asia Conference on Kinesiology and Sport Science & 10th International Conference on Movement, Health, and Exercise (MoHE)**

**DAY 2: September 11, 2024 (Wednesday)**

Time	Selangor 1	
10:20-11:20	<p align="center"><b>Keynote Lecture 3: Dr. Carl James (Hong Kong)</b>                      Wearable technologies for real-time monitoring to protect health and enhance athletic performance in international triathlon  <i>Moderator: Assoc. Prof. Dr. Raja Mohammed Firhad Raja Azidin</i></p>	
11:20-12:25	<b>Melati 4</b>	
	<b>Oral Presentation Session 6:</b> EXERCISE SCIENCE <i>Moderator: Assoc. Prof. Dr. Nik Shanita Safii</i>	
	ES138	Bibliometric Analysis on bodybuilding - <i>Chen Wei (China)</i>
	ES139	Innovations in Rowing Ergometer Training for Enhancing Fitness and Performance: A Narrative Review - <i>Shen Li (Malaysia)</i>
	ES163	Association Between Sprinting Performance and Lateral Change of Direction Ability in Elite Badminton Doubles Players - <i>Koh Weat Teck (Malaysia)</i>
	ES237	The short term health benefits of Air Badminton: a case- control study - <i>Mehd Anvari (Iran)</i>
	ES186	Effect of Sugared Drinks on Performance during Anaerobic Sprint Test and other Physiological Measures - <i>Peggy Boey (Singapore)</i>
ES241	Effects of different protocols of HIIT recovery phase on working memory and emotional regulation of sedentary young women - <i>Linxuan Guo (China)</i>	
12:25-13:45 LUNCH		

**Selangor 1**

**Special Session:**  
*Dr. JeongHyo Kim (Korea)*

The Necessity of Integrating Academic Names between Kinesiology and Sports Science

**14th Asia Conference on Kinesiology and Sport Science & 10th International Conference on Movement, Health, and Exercise (MoHE)  
DAY 2: September 11, 2024 (Wednesday)**

Time	THE DOME			
	Poster Presentation			
11:20 - 12:25	SM116	A study of the effect of 24-posture tai chi training on blood factor vitamin D in Chinese community MCI elders - <b>Danming Xu (China)</b>	SM121	A study of the effect of 6 months of resistance training on body composition indicators in a population with sarcopenia - <b>Junming Dai (China)</b>
	SM197	A survey of knowledge and attitudes regarding concussion among university men's lacrosse players - <b>Yuta Churei (Japan)</b>	SM164	Effect of high-intensity interval training on patients with type 2 diabetes mellitus - <b>Muhammad Arkan Rahmat (Indonesia)</b>
	SM189	Exploring the Application of an Artificial Intelligence-Based Postural Analysis Training System in Exercise Rehabilitation for Stroke Patients - <b>Wei Wu (China)</b>	SP018	The Influence and Mechanism of Anxiety on the Performance of Novice Golf Players - <b>Xiaodan Wei (China)</b>
	SP020	The effects of Chinese coaches' coaching styles on athletes' training engagement: the mediating role of situational motivation - <b>YongJie Pei (China)</b>	SP022	Autonomy Support and Sport Engagement Interactions: An Analysis Based on Latent Variable Growth Modeling - <b>Liqin Wang (China)</b>
	SP045	Pre-exposure Postural Precursors of Motion Sickness in Head-Mounted Displays: Comparing Head and Hand Control Modes - <b>Wei-De Shih (Taiwan)</b>	SP046	Effects of Different Frequency of Visually-guided Eye Movement on body sway and head-eye coordination - <b>Hsin-Wei Huang (Taiwan)</b>
	SP088	The Impact of Community Sports Environment and Peer Support on Physical Activity Among Overweight and Obese Children Aged 12-15 in China - <b>Mingxue Han (Malaysia)</b>	SP113	Effect of Athletes' Burnout on Psychological Resilience: The Chain Mediating Effect of the Meaning in Life and Perceived Social Support - <b>Xiani Chen (China)</b>
	SP0151	Retrospective analysis of flow experience and participants of different dance types - <b>MingYun Kuo (Taiwan)</b>	SP233	Swinging To Success: Impact of a 4-Week Chewing Gum Routine on Psychophysiological Responses and Putting Performance in Female Golfers - <b>Juliana Johan John (Malaysia)</b>
	SP0179	Research on the Application Status of Somatosensory Interaction Technology in Motor Intervention for Children with Autism - <b>Yaying Che (China)</b>	OT048	Clinical Psychometrist Properties of unsupported upper-limb exercise test in measuring upper limb function after median sternotomy - <b>Nur Ayub Md Ali (Malaysia)</b>
	SP227	The Mediating Role of Dispositional Optimism in the Relationship Between Athletes' Quality of Sleep and Mental Energy: A Cross-Sectional Study - <b>Frank Jing-Horng Lu (Taiwan)</b>	SP0148	The Benefits of Exercise on Reactive motor control for Seniors: is 65 years a Cut-off Point? - <b>Lanlan Zhang (China)</b>
11:20 -	MG131	A Review of Malaysia Sports Games (SUKMA) by States and Gender - <b>Fathynah Syarifah (Malaysia)</b>		-



**14th Asia Conference on Kinesiology and Sport Science & 10th International Conference on Movement, Health, and Exercise (MoHE)**

**DAY 2: September 11, 2024 (Wednesday)**

Time	THE DOME			
Poster Presentation				
<b>12:25</b>	OT128	A study on the effect of rapid extension and retraction based compound training on Chinese junior high school students' standing long jump performance - <b>Hou Yusheng (China)</b>	OT101	Effectiveness Of Taichi Exercises On The Focus Among Secondary School Students In China - <b>Yinshuang Shao (Malaysia)</b>
	OT156	A Comparative Analysis of Physical Education Teacher Training Programs: Validating a Chinese Theoretical Framework in Scotland and Australia - <b>Chenxi Yin (United Kingdom)</b>	ES234	The Effects of Long-Term Regular Resistance Training on Physical Fitness in the Elderly: A Three-Year Follow-Up Study - <b>Ke-Hau Chen (Taiwan)</b>
	ES029	The effects of exercise on vascular fibrosis with aging as an epigenetic regulator - <b>Seung Kyum Kim (Korea)</b>	OT213	Online Learning of Physical Education: Barriers, Perceived Readiness, and Perception of Support on Course Satisfaction - <b>Akhtar Tanveer (Malaysia)</b>
	ES228	Effects of PNF Stretching Combined with Lower Body Muscle Strength Training on Balance Ability in the Elderly <b>Zhu JinBiao (Malaysia)</b>	PE108	An experimental study on multi-feedback teaching method in basketball teaching for children aged 8-10 - <b>Gong ZiLiang (China)</b>
	ES127	Voluntary Wheel Running and Acetic Acid Supplement Failed to Attenuate Ovariectomy-induced Decline in Hippocampus Mitochondrial Function in Mice - <b>Byeongjun Ryu (Korea)</b>	SM201	Behavioral Study of Mice Undergoing Hypoxic Training - <b>Liu Tao (China)</b>
<b>12:25-13:45</b>	LUNCH			

**14th Asia Conference on Kinesiology and Sport Science & 10th International Conference on Movement, Health, and Exercise (MoHE)**  
**DAY 2: September 11, 2024 (Wednesday)**

Time	Melati 4		Selangor 1	Melati 5	
13:45 - 14:50	<b>Oral Presentation Session 7: EXERCISE SCIENCE</b> <i>Moderator: Assoc Prof Dr Ler Hui Yin</i>		<b>Special Lecture 3: Prof Dr. Li-Shiue Gau (Taiwan)</b> Sports where Taiwan excels at the Olympics	<b>Oral Presentation Session 8: SOCIO-CULTURAL ANALYSES OF SPORTS</b> <i>Moderator: Dr Alexander Ong</i>	
	ES232	University Students' Chronotype and Factors Affecting Their Sleep Patterns - <b>Chen Ming Hung (Taiwan)</b>		SC0214	Research on the status and sustainable development of home of martial arts in Henan Province - <b>Guo Liang (China)</b>
	ES064	Preliminary Findings: Effects of Combination Supplementation of Lignosus Rhinocerus and Eurycoma Longifolia on Endurance Running Performance among Athletes - <b>Fadzel Wong Chee Ping (Malaysia)</b>		SC0177	A Study on the Spatial Distribution Pattern and Causation Analysis of National Fitness Model Areas (Counties) in China - <b>Mao Lei (China)</b>
	SP0218	A Systematic Review and Meta- Analysis of Exercise for Reducing Cravings and Enhancing Health Parameters Among Peoples with Stimulant Use Disorder - <b>Duan Weipeng (Malaysia)</b>		SC230	Research on the Recreation Behavior Model of National Scenic Areas in Taiwan - <b>Cheng Feng-Mao (Taiwan)</b>
	ES0190	The Effect of Caffeine Mouth Rinse on Strength Performance - <b>Khong Teng Keen (Malaysia)</b>		SC0141	A study on the influence of sports consumption decision of college student groups in commercial fitness clubs in the post-epidemic era of COVID-19- based on the AHP model - <b>Chen ZhiWei (China)</b>
	OT003	Effects of Anaerobic Performance on Judo athletes of women by Anaerobic endurance training of Climbing plate - <b>Huang Liying (China)</b>		OT021	The Intersection and Integration of Confucian "Respect" Concept and Olympic Culture in the Post-Pandemic Era - <b>Feng Yuan (China)</b>
	ES0212	The Effects of Fatigue on Badminton Smash Performance and Core Stability Parameters among Badminton Players - <b>Tam Tong Pei (Malaysia)</b>		SC181	Analysis of Chinese Residents' Participation in Physical Activities and its Influencing Factors:Based on CGSS 2021 Data - <b>Yaying Che (China)</b>

**14th Asia Conference on Kinesiology and Sport Science & 10th International Conference on Movement, Health, and Exercise (MoHE)**

**DAY 2: September 11, 2024 (Wednesday)**

Time	Melati 4	Selangor 1	Melati 5		
14:50 - 16:20	<b>Young Investigator Award (YIA) Session 5: EXERCISE SCIENCE</b>		<b>Young Investigator Award (YIA) Session 6: APPLIED KINESIOLOGY</b>		
	ES039	Comparison Between Flywheel Resistance Training and Horizontal Plyometrics on Sprinting Acceleration Performance - <b>Siow Kai Wen (Malaysia)</b>	<p align="center"><b>Thematic Symposium 3: IMPROVING PEDAGOGICAL AND PSYCHOLOGICAL TRAINING METHODS FOR ATHLETES</b></p> <p align="center"><i>Moderator: Assoc Prof Dr Kee Kang Mea</i></p>	PE082	Examining Critical Thinking and Satisfaction within a Competency-Based Physical Education Program - <b>Tseng Meng-Chieh (Taiwan)</b>
	ES041	Effects of Repeated Hypoxic Exposure with High-Intensity Interval Cycling in Trained Athletes - <b>See Jet Ming (Malaysia)</b>		PE144	An experimental investigation on the impact of situational teaching methods on the physical fitness components of preschool children - <b>Ji Dong Ge (China)</b>
	ES096	Measured Resting Metabolic Rate and the Evaluation of Nutrition Intake of Regular Climbers in Klang Valley, Malaysia - <b>Jean Ann Sau (Malaysia)</b>		PE195	Preparing Teaching and Facilitating (TnLf) Activity for Gymnastic Skills: Challenges to Physical Education Teachers - <b>NURHIDAYAH YAAKOP (Malaysia)</b>
	ES149	Effects of Tiger Balm Active Muscle Rub on Endurance Performance and Other Physiological Measures - <b>Ng Yew Cheo (Singapore)</b>		MG173	The Value Essence, Vision, and Strategy of High-Quality Development of Chinese Mass Water Sports - <b>Zhang Yiheng (China)</b>
	ES150	Comparison of scapular function, rotator cuff muscle strength, and structural shoulder stability between with and without subjective shoulder instability in baseball players - <b>Rurina Yoshiara (Japan)</b>		MG175	The integration of physical education and outdoor sports into the school curriculum under the perspective of holistic education: The value implications, exploration of challenges, and pathways for advancement. - <b>Liu Zhi (China)</b>
	ES172	Contribution of Stretch-shortening Cycle Qualities to Badminton Change of Direction in Elite Badminton Players - <b>Low Jiun Yang (Malaysia)</b>		MG176	Temporal And Spatial Distribution Characteristics and Influencing of Village "BA" Network Attention - <b>Yin YiHang (China)</b>
	ES106	Effects of Pineapple Juice on Hydration Level During Post- Exercise Recovery - <b>Nursyuhada Mohd Sukri (Malaysia)</b>		OT126	The effects of a commercially available energy drink on resistance training performance - <b>Chen Zihao (China)</b>
	-	OT187		The Effect of Specific Time-Efficient Warm-Up on 1RM Squat Performance - <b>Nor Ikhmar Madarsa (Malaysia)</b>	
16:20- 16:40	TEA BREAK				

**14th Asia Conference on Kinesiology and Sport Science & 10th International Conference on Movement, Health, and Exercise (MoHE)  
DAY 2: September 11, 2024 (Wednesday)**

Time	Melati 4	Selangor 1	Melati 5		
16:40 - 17:45	<b>Oral Presentation Session 9: SPORT MEDICINE &amp; ATHLETIC TRAINING</b> <i>Moderator: Assoc. Prof. Dr Chan Kai Quin</i>		<b>Oral Presentation Session 10: EXERCISE SCIENCE &amp; SPORT MANAGEMENT</b> <i>Moderator: Assoc. Prof. Dr. Roosfa Hashim</i>		
	OT086	Supervised Incremental Resistance Training Versus Standard Care Following Median Sternotomy - A Preliminary Analysis of Safety and Feasibility: A Randomized Controlled Trial - <i>Nur Ayub Md Ali (Malaysia)</i>	<b>Special Lecture 4:</b> <i>Dr. Mury Kuswari (Indonesia)</i> Tele-Exercise: A New Approach to Overcome Obesity Problems among White Collar Workers	ES229	Relationships between Muscle Types and Individual Threshold Capacity of Dragon- Boat Rowers - <i>Tien Yung-Hui (Taiwan)</i>
	SM0193	The Effectiveness of the Body CATalyst Program on Quality of Life in Individuals with Musculoskeletal Pain - <i>Tai Mei Chiew (Malaysia)</i>		MG081	Carbon footprint assessment of marathon participants - <i>Wang Meng (China)</i>
	OT0200	A Study on the Current Situation of Physical Activity Among Senior Intellectuals in Universities and its Relationship with Physical Health - <i>Dan Huang (Malaysia)</i>		OT049	The Regulation and Development of Sports Law of the PRC on National Fitness - <i>Chen Huarong (China)</i>
	-			OT0203	Development and Validation of an Instrument to Assess Factors Influencing Herbal Supplement Consumption among University Athletes: A KAP and Health Belief Model Approach - <i>Yan Yanfeng (Malaysia)</i>
	-			ES240	Effect of Badminton in Improving Heart Rate Variability of Overweight Recreational Badminton Players: A Randomized Control Trial - <i>Dobson Dominic (India)</i>
-		ES169		Effects of a 6-Week Functional Movement Exercise Programme on Breast Cancer Patients: A Preliminary Investigation - <i>Cynthia Anne Cornelius (Malaysia)</i>	
<b>END OF DAY 2</b>					



**14th Asia Conference on Kinesiology and Sport Science & 10th International Conference on Movement, Health, and Exercise (MoHE)  
DAY 3: September 12, 2024 (Thursday)**

Time	Selangor 1	
08:00-09:30	<b>Young Investigator Award (YIA) Final Presentation</b> <b>SRB Chairman: Assoc. Prof. Dr. Govindasamy Balasekaran</b>	
09:30-10:30	<b>Keynote Lecture 4: Professor Dr Rob Duffield (Australia) Yang</b> <b>Optimising Recovery for Athletes</b> <b>Moderator: Assoc Prof Dr Kok Lian Yee</b>	
10:30-1050	TEA BREAK	
10:50-12:40	<b>Melati 4</b>	
	<b>Oral Presentation Session 11:</b> <b>SPORT AND EXERCISE PSYCHOLOGY</b> <b>Moderator: Prof Dr Wee Eng Hoe</b>	
	SP238	The Effects of Primary School-Based Badminton on the Physical, Psychological, and Social Well-Being of Malaysian Indigenous Schoolchildren - <b>Young-Eun Noh (Malaysia)</b>
	SP239	Wellbeing in Para-badminton players: sports and psychosocial factors at play. - <b>Yuhanis Adnan (Malaysia)</b>
	SP038	The effects of mantra intervention on state anxiety and 100-m sprint performance in student athletes. - <b>Wan YuJue (China)</b>
	SP0222	Examining the Effects of Leisure Sport Activities for the Visually Impaired: Using Tai Chi and Walking as Examples - <b>Gau Li-Shiue (Taiwan)</b>
	SP0109	The Relationship between College Students' Exercise Motivation and Physical Activities: Mediated by Self Efficacy and Moderated by Gender - <b>Sheng Jiazhi (China)</b>
	SP0215	Investigating the Multidimensional Motivation of Chinese Amateur Badminton Players - <b>Li Chongwei (Malaysia)</b>
	SP0220	The Impact of Cognitively Engaged Physical Exercise on Children's Executive Function - <b>Liang Jiafeng (China)</b>
	SP0216	<i>Validation of the Athlete Burnout Questionnaire-Badminton for Chinese university student-athletes</i> - <b>Ren Xuyue (Malaysia)</b>
SP0107	Influence of basketball on the mental health of left-behind children in cities - <b>Gong ZiLiang (China)</b>	
	<b>Selangor 1</b>	
	<b>Thematic Symposium 4:</b> <b>ENHANCING PERFORMANCE THROUGH STRENGTH AND CONDITIONING PRACTICES</b> <b>Moderator: Assoc Prof Dr Kok Lian Yee</b>	
		<b>10:50-12:20</b>
		Utilising Wearable Technology during Strength and Conditioning for Improved Performance and Recovery - <b>Professor Dr John Cronin (New Zealand)</b>
		Current Strength and Conditioning Practices in Southeast Asia - <b>Mr. Jad Adrian Washif (Malaysia)</b>
		Strength and Conditioning Education in Malaysia - <b>Prof Dr Nur Ikhwan bin Mohamad (Malaysia)</b>
		Training Load Monitoring to Maximise Performance in Team Sports - <b>Assoc Prof Dr Raja Mohammed Firhad Raja Azidin (Malaysia)</b>
12:40-13:10	<b>YIA AWARDS GIVING AND CLOSING CEREMONY</b>	
13:10-14:30	LUNCH	
	<b>END OF CONFERENCE</b>	

## EXERCISE SCIENCE

Abstract ID: OP-ES016

### Evaluating thermal strain levels of Japanese high-school KOSEN students during shuttle run tests as an alternative endurance running tests

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Endurance running (ER) tests in physical education (PE) classes are common in Japanese high schools. Although the Wet Bulb Globe Temperature index (WBGT) is monitored to ensure the safety of ER tests, previous studies (Yokota and Kawabata, 2023, 2024) indicated that the physiological strain levels (PSL) of runners during ER tests were very high, which suggests they were susceptible to heat-related illness during testing. In this study, the shuttle run (SR) test was introduced as an alternative ER test, and the KOSEN students' PSL, other physiological and environmental conditions were evaluated during SR tests. A total of 31 male high school KOSEN students (Height: 168.5±6.6 cm; Weight: 61.1±9.0 kg) participated in an indoor SR test during their physical education classes in July or November. Wearing T-shirts and shorts, and heart rate (HR) sensors, they ran 40m back and forth (2x20m) repetitively until they voluntarily quit. Real-time HR and environmental conditions (air temperature, relative humidity, WBGT) were monitored. The data were used to calculate the students' PSL using a two-node thermal model (Yokota and Berglund, 2006). The indoor WBGT measurements during the tests ranged between the safe (15.6°C) and caution (24.6°C) guidelines. Despite no significant thermal safety risk being identified using WBGT, 93.5% of the students' PSLs were highly elevated. Although the WBGT indicated it was safe to exercise, high PSL of the runners suggests indoor SR tests even pose a significant risk for heat-related illnesses. Specifically, individuals with higher resting HR (>90 bpm), lower exercise habit, and longer SR duration (> 8 min), need careful monitoring for heat-related illness.

[This work was supported by JSPS KAKENHI Grant C[21k11515]]

**Key Words:** shuttle run, WBGT, thermal modeling, physiological strain, physical education

Abstract ID: OP-ES042

### The Impact of Physical Exercise on Brain-Derived Neurotrophic Factor Levels: A Meta-Analysis Study

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This meta-analysis evaluates the impact of physical exercise on Brain-Derived Neurotrophic Factor (BDNF) levels in middle-aged and elderly populations, exploring its potential benefits for neurological health and cognitive improvement. Detailed searches were conducted in databases such as PubMed, ScienceDirect, and Web of Science, selecting 13 high-quality

studies based on strict inclusion criteria. These studies encompassed various types of exercise, frequencies, and intensities, and included a diverse demographic profile of participants. Analytical methods involved using a random effects model to calculate the standardized mean difference (SMD) in BDNF levels, along with funnel plots, fail-safe numbers (FSN), and trim-and-fill methods to address potential publication biases. Additionally, extensive subgroup analyses were performed to further investigate the effects of age, gender, type of exercise, and its intensity and duration on BDNF levels. The comprehensive results of the meta-analysis show that physical exercise significantly increases BDNF concentrations (SMD = 0.275, 95% CI: 0.15-0.40), with notably stronger effects observed in elderly participants (SMD = 0.375, 95% CI: 0.223-0.558), compared to the more modest increases seen in middle-aged individuals (SMD = 0.073, 95% CI: -0.144-0.289). This difference highlights the physiological variations in exercise responses across age groups and emphasizes the potential influence of baseline BDNF levels on these outcomes. Regular physical activity significantly enhances BDNF levels, particularly aiding in the prevention of neurodegenerative diseases. The study underscores the need for further research to deepen the understanding of the relationship between physical exercise and BDNF, and to explore how to optimize exercise interventions. These interventions aim to maximize the benefits for brain health, thereby providing a theoretical foundation for formulating personalized exercise prescriptions tailored to individual health profiles and needs.

**Key Words:** Exercise, Brain-Derived Neurotrophic Factor, Cognitive Functions, Brain Health, Meta-Analysis

Abstract ID: OP-ES134

### Analysis of Competitive Performance Characteristics of Top Male Jumpers in the World

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This study aims to analyse the competitive performance characteristics of top male jumpers in the World Athletics Championships from the 15th (2015) to the 19th (2023) editions, focusing on the top eight athletes in long jump, triple jump, high jump, and pole vault finals, totalling 163 athletes. The analysis intends to provide insights for Chinese athletes' training and competition preparations, especially for the upcoming 20th World Championships in Japan. Literature Review: Relevant literature was sourced from CNKI, and performance data were collected from official results. Statistical Analysis: Data were analysed using SPSS and Excel, examining athletes' ages, season-best performances, performance consistency, and success rates. Age Analysis: The age range of the top eight male jumpers was 18-36 years, with an average age of 26.22 years. Long jumpers averaged 25.52 years, triple jumpers 26.95 years, high jumpers 26.55 years, and pole vaulters 25.87 years. Medallists averaged 26.05 years, and champions 26.1 years. Performance Analysis: The highest performances were recorded in the 17th and 18th championships, with notable jumps of 8.69m in long jump, 17.95m in triple jump, 2.37m in high jump, and

6.21m in pole vault. High jump and triple jump exhibited smaller performance variances compared to long jump and pole vault. Success Rates: In finals, success rates were highest in high jump (75.24%), followed by pole vault (68.39%), triple jump (66.09%), and long jump (64.26%). Triple jump success rates significantly correlated with final rankings ( $r=-0.762$ ,  $p=0.028$ ). Consistency and Endurance: Long jumpers displayed endurance with success rates stabilizing after initial declines. High jumpers faced increased fouls and performance drop-offs as heights increased. Male jumpers have a relatively long competitive age span, showing a trend towards younger ages. Triple jumpers and high jumpers show more stable performances compared to their counterparts. High jump events have higher success rates but are less dependent on them compared to long jump events. Strong event-specific endurance is evident in long jump, while high jump sees increased fouling under height stress. Effective management of jump heights and rest intervals is crucial for high jumpers to maintain performance and reduce fouling.

**Key Words:** World Athletics Championships, jumping events, competitive performance characteristics

Abstract ID: OP-ES072

### Effect of aerobic exercise combined with probiotics on skeletal muscle glucose metabolism through AMPK/Rab5/GLUT4 pathway in T2DM rats

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To observe the effects of aerobic exercise combined with probiotic intervention on insulin, glucose metabolism, and other related indicators in T2DM rats induced by a high sugar and high-fat diet combined with low-dose STZ. Based on the AMPK/Rab5/GLUT4 signaling pathway analysis, the preventive and therapeutic effects of aerobic exercise combined with probiotic intervention on T2DM were investigated. The aim is to explore whether the combined intervention is superior to aerobic exercise and probiotic intervention alone, in order to provide scientific basis and theoretical basis for the treatment of T2DM. Forty male SD rats were selected in this experiment, and 6 rats were randomly divided into the normal group (group N), and the remaining 34 rats were randomly divided into the diabetes model group (DM group). (1) Aerobic exercise and probiotic intervention can improve the body weight, FBG, OGTT, ITT, and increase the tolerance of T2DM rats to glucose load, regulate skeletal muscle glucose metabolism disorders, and the combination of the two has a better effect. (2) Aerobic exercise and probiotic intervention can improve the tissue morphology and structure of skeletal muscle in T2DM rats, increase the glycogen content of skeletal muscle, and the combination of the two has a better effect. (3) Aerobic exercise and probiotics can improve T2DM through the AMPK/Rab5/GLUT4 signaling axis, and the combined effect of the two is better. The mechanism may be related to improving skeletal muscle glucose metabolism.

**Key Words:** Exercise, Probiotics, Skeletal muscles, Type 2 diabetes, Sugar metabolism

Abstract ID: OP-ES079

### Analysis of the effect of Otago exercise program combined with Baduanjin on the balance ability of middle-aged and elderly women

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To investigate the effects of Otago Exercise Program(OEP) combined with Baduanjin on the balance ability of middle-aged and elderly women, using Y balance test (YBT). Healthy middle-aged and elderly women with an average age of  $59.4\pm 4.9$  years and body fat of  $28.7\pm 4.7$ kg/m ( $n=60$ ) were randomly divided into observation group and control group with 30 cases in each group. Exercise intervention was performed for 16 weeks. The control group was given eight Duan brocade exercises, and the observation group was added OEP on the basis of the control group. YBT measures the ability to balance in the anterolateral (RA,LA), posterolateral (RPL,LPL), posterolateral (RPM,LPM) directions. The measurement results of 2 groups before and after intervention were analyzed. The experimental results were obtained by using the arrival distance (cm) and paired sample T test, and there was a significant difference between the two groups before and after the experiment ( $P<0.005$ ). The mean variation of the observation group was 3.6 cm, and the standard error was 1.8 cm. In the control group, the mean variation was 0.8cm and the standard error was 1.5cm. The Mean Difference was 2.8 cm with a 95% confidence interval of 0.4 cm to 5.2 cm. RA (3.566, 1.660 to 5.4719), LA(1.966, -0.047 to 3.979), RPL(2.633, 0.851 to 4.414), LPL (2.933, 1.249 to 4.616), RPM (2.766, 0.768 to 4.763), LPM (2.333, 0.645 to 4.020). The effect of OEP combined with Baduanjin exercise is better than that of Baduanjin exercise alone, which can improve the lower limb muscle strength and balance flexibility of middle-aged and elderly women and reduce the risk of falling.

**Key Words:** Otago, Eight pieces of brocade, Middle-aged and elderly women, Balance ability, Fall risk

Abstract ID: OP-ES207

### Harnessing The Power of Aerobic and Resistance Exercise: A Neuroprotective Strategy Against AIC13-Induced Neurodegeneration in Rats

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Physical exercise, encompassing any physical activity that enhances or maintains physical fitness, overall health, or well-being, is an important component of a healthy lifestyle. Physical exercise can be broadly categorized into aerobic and resistance exercises. Neurodegenerative diseases, marked by the progressive degeneration of neurons in the brain and nervous system, lead to a gradual decline in cognitive, motor, and functional capacities, impacting an individual's quality of life.

Regular physical activity helps maintain cognitive function, improve motor abilities, and enhance overall quality of life by promoting neuroplasticity and improving neuron health. In our study, we aimed to investigate the effects of both aerobic and resistance exercises on reversing neurodegenerative conditions in rats. We induced neurodegenerative conditions in adult Wistar rats by administering AIC13 through oral gavage for 8 weeks. Starting week 5, the rats underwent a 4-week exercise intervention, either aerobic or resistance. Cognitive function was assessed using neurobehavioral tests, including the Open Field Test and Novel Object Recognition Test conducted at three key stages: before induction, before intervention, and after intervention. The results demonstrated that both exercise interventions significantly reversed cognitive impairments. In the Open Field test for anxiety-related assessment, aerobic exercise ( $0.8867 \pm 0.270$ ) significantly increased the frequency of entries into the centre zone, followed by resistance exercise ( $0.8333 \pm 0.2472$ ), compared to the AIC13-only group ( $0.2078 \pm 0.0757$ ). In contrast, in the Novel Object Recognition test for memory assessment, resistance exercise ( $1.065 \pm 0.1185$ ) showed a greater preference percentage ratio, followed by the aerobic exercise ( $0.8030 \pm 0.09$ ) compared to the AIC13-only group ( $0.4288 \pm 0.07$ ). Both exercise groups showed no significant differences in the post-intervention phase compared to their pre-induction phase across both neurobehavioral tests. These findings suggest that both forms of exercise effectively mitigate brain deterioration, reversing neurodegeneration and protecting brain function, thereby promoting healthier ageing.

**Key Words:** physical exercise, neuroprotection, neurodegeneration, cognitive function

Abstract ID: OP-ES050

### Badminton Fatigue Protocol Based On Time-Motion Patterns of Elite Finalist

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This study developed a fatigue protocol based on time-motion analysis of elite badminton matches. Ten video matches between 2013-2018 of six world-elite players were notational analyzed using Nacsport Elite software and validated by two independent analysts. For 20 match sides, each movement before every shot was coded for action (e.g. jump, lunge), generating a sequence of actions from each rally. All sequences were then reversed, beginning with the last action and ending with the first before a sequential analysis using the TraMine package in R-project software was performed. Therefore, sequences were converted into "distances" and sequences similar in actions and "distance" formed a cluster pattern within a dendrogram. Any combination of minimal 2 actions occurring minimally twice, was considered a pattern. Additional notational coding was performed for the number of steps, origin-direction of each action, as well as rally-time and inter-rally rest-time. Results indicate 79 movement patterns across all match sides. The single most common action pattern found was FULL LUNGE–FULL LUNGE–JUMP–HALF LUNGE. After ranking, the 27 most

common patterns were identified for the fatigue protocol. Together they best represent a 3-set match (20 points per side per set), because they (multiplied by occurrence frequency) totalled 127 rally sequences and about 108 minutes of combined rally-time plus rest-time. Furthermore, these 27 patterns ranged from: 4-9 in frequency per match, 4-14 actions per rally, 5.45-21.37 seconds of rally-time, and 21.57-50.43 seconds of inter-rally rest-time. Further analysis of the average number of steps, and the most common origin-direction associated with each action, completed the fatigue protocol. Semi-randomization of all sequences may form a fatigue protocol that simulates common movement patterns of a high-intensity badminton match, for the purpose of fitness testing. Though, validation of this fatigue protocol requires a comparison with actual physiological exertion of an elite final match. A fatigue protocol simulating a high intensity match was developed, additional research is needed to validate this fatigue protocol, through for example heart rate validation.

**Key Words:** badminton, fatigue protocol, notational analysis, sequential analysis, movement patterns

Abstract ID: OP-ES068

### Profiling Balance Across Multiple Malaysian Skill Sports

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The purpose of this study is to provide a balance profile assessment for National Malaysian skill sports athletes. This sway profile may serve as a reference for future development athletes of skill sports in which balance is believed to be an important aspect of performance. A total of eighty three National athletes with breakdown of eight men's artistic gymnastics, five women's artistic gymnastics, nineteen lawn bowls, eleven petanque, five rhythmic gymnastics, sixteen shooting and nineteen tenpin bowlers who are in the national program for a minimum of two years were recruited for the study. Two Kistler force plates were used to collect data from all athletes for a duration of thirty seconds in parallel stance. The test is repeated three times. Sway results are obtained from MARS software. Kolmogorov-Smirnov test revealed data to be not normally distributed. Kruskal Wallis H test showed that there was a statistically significant difference of body sway between the investigated variables (Total Sway Path:  $\chi^2(6) = 41.036$ ,  $p = 0.000$ , Total Sway Velocity:  $\chi^2(6) = 41.329$ ,  $p = 0.000$  and Total Sway Area:  $\chi^2(6) = 27.391$ ,  $p = 0.000$ ) of different sports. Shooting has the least body sway compared to other sports. This is contributed by the nature of the sports that they train and compete, which facilitate the future sport scientist and coaches. This data could also be used as a benchmark for talent identification.

**Key Words:** Balance profile, skill sport, sway path, sway velocity, gymnastics

**YIA Presentation S1 (Day 1 - morning session)**



# SPORT BIOMECHANICS AND TECHNOLOGY & EXERCISE SCIENCE

Abstract ID: YIA-BT204

## Correlation between pivot-leg knee kinematics and kinetics during the stride phase in baseball pitching

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The purpose of this study was to identify the kinematic characteristics of the pivot-leg knee joint during the stride phase of baseball pitching, and their effects on joint kinetics, ground reaction forces (GRF), and ball release velocity. Seven collegiate baseball pitchers (age: 19.6±1.8 years; height: 1.79±0.08 m; body mass: 75.0±8.8 kg) participated in this study. Motion and GRF data were collected with a 14 camera motion capture system (Vicon Nexus 2.10.1) at 250Hz and two force plates (AMTI, Watertown, MA) at 1000Hz, respectively, and analyzed with Visual 3D (C-motion, Inc, Germantown, MD). Kinetic parameters and GRF values were normalized by dividing by body weight. During the stride phase, maximum knee varus angle and angular velocity of knee adduction (valgus) moment were found to be positively correlated with maximum GRFx (in the direction of ball flight) ( $P = .013$ ,  $P = .016$ ). This positive correlation was also found in knee varus angle at stride foot contact ( $P = .004$ ). On the contrary, maximum extension angular velocity during the stride phase was negatively correlated with both maximum GRFx and ball speed ( $P = .039$ ,  $P = .002$ ), while knee flexion angle showed no significant correlation with either maximum GRFx or ball speed. Furthermore, knee flexion and various angles were positively correlated with the corresponding joint torques ( $P < .05$ ), but significant correlation between these torques and GRF or ball speed was not found. These results indicate that the pivot leg knee joint plays a crucial role in generating greater propulsive force, while flexion and extension of the sagittal plane are likely related to increased joint torque.

**Key Words:** baseball pitching, knee joint, kinetics, kinematics

Abstract ID: YIA-BT205

## The Effect of Dynamic Taping on Shoulder Kinematics and Ball Velocity in Baseball Pitching

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The purpose of this study was to observe the effect of dynamic taping (focusing on internal rotation taping technique) on the shoulder biomechanical changes and release velocity in baseball pitching. Baseball pitching is one of the fastest human movements. Under the high-speed, high-intensity conditions, the effectiveness of elastic dynamic tape in enhancing performance is evaluated. Randomized crossover trials were adopted. Five first-division collegiate baseball pitchers without histories of shoulder surgery and recent injuries participated in this study.

After a routine warm-up, players performed ten pitches first without and then with taping, or first with and then without taping. The full pitching motion was captured using a 12-camera Vicon motion capture system, and upper body kinematic parameters were analyzed using OpenSim (4.5). Shoulder maximal external rotation, shoulder internal rotation angular velocity during the acceleration phase, and ball velocity in the two conditions were compared. Paired t-tests ( $\alpha=0.05$ ), effect size calculations (Cohen's  $d$ ), and repeated measures ANOVA were used to analyze data. Maximum shoulder abduction was slightly lower in the taping group than the control group. Paired sample t-tests and repeated measures ANOVA showed no significant differences between the taping and non-taping groups in terms of maximum external rotation angle, shoulder internal rotation velocity during the acceleration phase, or ball speed. Paired t-tests also indicated no significant difference between the two groups. Although the difference in maximum shoulder external rotation angle approached statistical significance in the ANOVA analysis, the overall findings suggest that dynamic shoulder taping did not significantly affect these kinematic parameters or ball speed. Effect sizes for the three parameters were small, except for ball speed, which exhibited a medium effect. Dynamic taping does not alter shoulder abduction range of motion during pitching, nor does it influence shoulder internal rotation velocity during the acceleration phase or overall ball speed performance. Despite the elastic property and corrective functions of dynamic taping, a single strip of tape may not be sufficient to modify movement patterns under conditions of high speed and force application. Future studies are recommended to examine electromyography or to increase the number of tape strips for examining the effect of taping.

**Key Words:** baseball pitching, shoulder kinematic, dynamic taping, ball velocity, shoulder taping

Abstract ID: YIA-BT053

## Informed Training with Shot Patterns of Elite Badminton Finalist

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This study aimed to identify common shot patterns by elite badminton players for training purposes. Ten matches between 2013-2018 of four world-elite players (average 5 matches per player) were notational analysed from video using Nacsport Elite software and validated by two independent analysts. For each player and each rally, the last (maximum) 10 shot types (e.g. drive, lob, net, smash) were coded, generating a sequence of rally ending shots. All sequences were then reversed, beginning with the last shot and ending with the "first", before a sequential analysis was performed using the TraMine package in R-project software. Therefore, sequences were converted into "distances" and sequences similar in shots and "distance" formed a cluster pattern within a dendrogram. Any combination of minimal 2 shots occurring minimally twice, was considered a pattern. Additional notational coding was performed for the origin and direction of each shot as well as rally successfulness. Results showed 94-130 shot patterns ranging between 2-4 across players. After ranking, the most and least common patterns of each player

### Single Session of Graded Treadmill Exercise Triggers the Increase of Lactate Dehydrogenase Levels in Athletes: A Cross-Sectional Study

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The present study examined the impact of single sessions of graded treadmill exercise on the lactate dehydrogenase (LD) in young healthy athletes. A cohort of 20 physically fit male athletes aged  $23.75 \pm 1.45$  years were randomly chosen and underwent single sessions of 5 minutes each of high intensity exercise (HIE) with 77-95% of HRmax, moderate intensity exercise (MIE) with 64-76% of HRmax, and low intensity exercise (LIE) with 57-63% of HRmax separated by one week wash out period. This cross-sectional study was carried out in the Department of Physical Education at Banaras Hindu University in Varanasi, India. LD levels were measured in blood samples taken before, immediately after, and 10 and 20 minutes after each form of exercise. LD levels differed significantly across intensity ( $ES=0.34$ ;  $p<0.05$ ) and time points ( $ES=0.58$ ;  $p<0.05$ ) as determined by repeated measures ANOVA. A post-hoc analysis with Bonferroni adjustment indicated that HIE ( $p<0.05$ ) resulted in a significant rise in LD levels compared to moderate and low intensity activities. Furthermore, post hoc analysis revealed a significant rise in LD levels immediately post exercise ( $p<0.05$ ), followed by a decline at 10 minutes post-exercise, ultimately returning close to baseline levels after 20 minutes. The study highlights the role of exercise intensity in regulating LD levels, providing insights for metabolic responses and potential applications in exercise prescription and rehabilitation protocols.

**Key Words:** Athletes, Biochemical Markers, Exercise Intensity, Metabolic Response

### The Reliability and Validity of the Cobb Method Using Dual-Energy X-ray Absorptiometry in Individuals with Idiopathic Scoliosis

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Idiopathic scoliosis (IS), more prevalent in females, is typically monitored biannually with spine radiographs using the Cobb method, the most widely used for assessing spinal curvature. Concerns about radiation exposure have led to the adoption of dual-energy X-ray absorptiometry (DEXA) due to its safety and efficacy in measuring bone mineral density, a crucial prognostic factor for curve progression. Although DEXA demonstrates potential for evaluating spinal alignment, its validity and reliability in measuring Cobb angles require further verification. To study the test-retest reliability and concurrent validity of the Cobb method in the coronal plane using DEXA and radiography techniques in females with IS. This study is a comparative study that included seventeen females aged 18 to 22, who had

across all games were identified. Overall, the single most common pattern of each player frequented between 10-16 times. Conversely, the least common patterns frequented 2 times, but consisted of many different patterns (51-109 across players). On average, the most common shot pattern was NET-SMASH (11.8 times/player), although it's direction and successfulness (46.7%, 66.7%, 71.4%, 93.7%). Badminton rallies end with many different shot sequences. From many different patterns with low frequency to few patterns with high frequency. Also, these patterns vary in direction and successfulness. Future research should investigate patterns within a whole rally, by set, and/or combined shot sequences of player and opponent. Additional research is required on how patterns can be used for training anticipation or tactics using reaction and prediction tests or practicing patterns with an opponent-partner.

**Key Words:** badminton, shots, patterns, rally

### Effects of High-Intensity Exercise on Blood and Liver Function Markers in Athletes: A Cross-Sectional Study

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The objective of the present study was to examine the impact of a single bout high-intensity exercise (HIE) session with 77-95% of HRmax on the markers of blood and liver function in athletes. This cross-sectional research was conducted within the Department of Physical Education at Banaras Hindu University in Varanasi, India. A cohort of 20 physically fit male athletes aged between 22 and 26 years was chosen at random and subjected to a 5-minute session of HIE. Blood samples were collected prior to the exercise, immediately after, and at 10 and 20 minutes post-HIE to examine selected blood and liver function markers. A significant difference was observed in hemoglobin ( $ES=0.71$ ;  $p<0.05$ ), white blood cell count ( $ES=0.76$ ;  $p<0.05$ ), red blood cell count ( $ES=0.76$ ;  $p<0.05$ ), platelet count ( $ES=0.56$ ;  $p<0.05$ ), and Serum Glutamic Oxaloacetic Transaminase (SGOT) levels ( $ES=0.27$ ;  $p<0.05$ ) across different time points, as determined by repeated measures ANOVA, whereas, there was no significant difference in Serum Glutamic Pyruvic Transaminase (SGPT) levels ( $ES=0.07$ ;  $p>0.05$ ). Post hoc analysis with Bonferroni adjustment indicated a significant increase immediately after the HIE, followed by a decrease 10 minutes post-exercise, with levels returning close to baseline after 20 minutes, except for platelets. The study highlights the temporary yet significant impact of a single high-intensity exercise session on athletes' blood and SGOT liver function markers, emphasizing the need for careful monitoring and effective recovery strategies during training.

**Key Words:** Athletes, Exercise, Serum Biomarkers, Vigorous Physical Activity

received a spinal alignment assessment using plain radiography within three months and were diagnosed with IS without a history of spine reconstruction. Each participant underwent two DEXA assessments over a one-week interval. The test-retest reliability of the Cobb method was assessed on both DEXA images (DEXA1 and DEXA2). These images were analyzed by a specialist using the DICOM viewer program, the standard software for viewing medical images with high-quality visuals. Furthermore, the validity of the Cobb method was evaluated by comparing DEXA results with those obtained from plain radiography. The Cobb angle measurements on DEXA images demonstrated excellent test-retest reliability (ICC2,1 = 0.956; 95% CI = 0.88 to 0.98). There was a good to excellent correlation between plain radiography and DEXA1 ( $r = 0.93$ ;  $p < 0.001$ ) as well as DEXA2 ( $r = 0.86$ ;  $p < 0.001$ ). The mean difference in Cobb angles between plain radiograph and DEXA measurements was  $4.24 \pm 1.45^\circ$  (DEXA1) and  $3.02 \pm 2.02^\circ$  (DEXA2), indicating a lower magnitude when compared to plain radiography. DEXA demonstrates consistent accuracy in assessing spinal alignment in the coronal plane, suggesting its potential utility in clinical scoliosis surveillance.

**Key Words:** DEXA, Radiography, Scoliosis, Spinal alignment, Cobb angle

Abstract ID: YIA-ES063

### Effect of Fatgripz Resistance Training On Upper Body Strength And Grip Strength In Active Male Subjects

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The study aimed to examine the effects of Fat Gripz resistance training on upper body strength and handgrip strength in active male subjects. Twenty active males were divided into an experimental group (EG,  $n=10$ ; age:  $21.6 \pm 1.64$ ; weight:  $74.06 \pm 9.62$  kg; height:  $173.8 \pm 3.26$  cm; years of resistance training experience:  $2.8 \pm 1.40$  years) and a control group (CG,  $n=10$ ; age:  $21.2 \pm 1.32$ ; weight:  $76.8 \pm 15.40$  kg; height:  $172.5 \pm 5.62$  cm; years of resistance training experience:  $1.8 \pm 1.23$  years) using the systematic counter balancing method. Both groups underwent a series of tests which included 1RM bench press and handgrip strength tests before and after the intervention. The experimental group used Fat Gripz attachments during their resistance training program, which consisted of six upper body exercises with a rep range between 10-12 repetitions (Chest bench press, incline bench press, chest fly, pull up, bent over row, and shoulder extension). The adapted exercises were consistent across the intervention period. Progressive overload was applied in the training programme (Increase in intensity from 60% of 1RM to 80% of 1RM from week 1 to week 8) T-test results indicated no significant differences between the experimental and control groups in the 1RM bench press and handgrip strength tests in the pre and post-test. However, within the experimental group, significant improvements were observed in the 1RM bench press test ( $p < 0.001$ ) and handgrip strength tests for both the non-dominant hand ( $p = 0.004$ ) and dominant hand ( $p = 0.007$ ) compared to their pre-intervention values. In contrast,

the control group showed significant improvement only in the 1RM bench press test ( $p < 0.001$ ) from pre- to post-test, with no significant changes in handgrip strength. In conclusion, the study found that Fat Gripz resistance training had shown a significant difference in handgrip strength in the experimental group.

**Key Words:** fatgripz, upper body strength, handgrip strength, active male

Abstract ID: YIA-ES071

### Effect of 6 weeks Flywheel Eccentric Overload Training and Fast Eccentric Resistance Training on 1RM Back Squat Among Resistance Trained University Students

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This study aimed to investigate the effectiveness of flywheel eccentric overload training and fast eccentric resistance training on 1RM back squat among resistance-trained university students. Although flywheel eccentric overload training has gained popularity as a strength and conditioning approach to enhance athletic performance, especially lower limb strength, limited research has compared its effectiveness versus resistance training by using the same training exercises. A total of 30 students were randomly assigned to a flywheel eccentric overload training (FT) group ( $n = 15$ ; age =  $22.0 \pm 1.7$  years), and fast eccentric resistance training (RT) group ( $n = 15$ ; age =  $22.1 \pm 1.0$  years). A 6-week intervention twice a week was conducted for both groups, where the FT group underwent flywheel training and the RT group underwent resistance training. The participants were tested on a 1RM back squat performance before and after the 6-week intervention period. The analysed data showed a significant improvement in 1RM back squat performance for both groups ( $p < .001$ ). The FT ( $M=108.5 \pm 12.1$  kg) and RT ( $M=108.0 \pm 12.4$  kg) groups improved from their pre-test to post-test, FT ( $M=121.3 \pm 13.3$  kg) and RT ( $M=114.2 \pm 11.9$  kg), respectively. However, there were no significant differences between the FT and RT groups ( $p > .05$ ). Flywheel eccentric overload training yields a similar outcome as fast eccentric resistance training for the 1RM back squat. Both modalities produce a higher eccentric force. Flywheel training may be an alternative method to resistance training for lower body strength.

**Key Words:** flywheel eccentric overload, 1 repetition maximum back squat, fast eccentric, resistance trained university students

## Poster Presentation

Abstract ID: BT006

### Mechanical Asymmetries Remain Low-To-Moderate During 30 Minutes Of Self-Paced Treadmill Running

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We characterized the magnitude and range of gait asymmetry during self-paced treadmill running. On an instrumented treadmill, twelve trained runners (11 males, 1 female) completed a 30-min self-paced run, during which participants were instructed to cover the most distance possible. Ground reaction force recordings at a constant velocity corresponding to 70% of their maximal aerobic velocity (13.30.8 km.h<sup>-1</sup>) allowed for the measurement of running kinetics and kinematics, as well as the calculation of spring-mass characteristics at the beginning, middle, and end of the run (minutes 1, 14 and 29, respectively). Group mean asymmetry scores were assessed using the symmetry angle formulae, where scores of 0% and 100% represent perfect symmetry and perfect asymmetry, respectively. There was no time effect on symmetry angle scores for any of the 13 biomechanical variables ( $P < 0.128$ ). Mean SA scores were <2.5% for contact time (0.80.7%), flight time (1.40.6%), step frequency (0.70.3%), duty factor (0.70.3%), duration of braking (1.30.7%) and push-off phases (0.90.8%), as well as peak braking (2.31.3%) and push-off forces (1.40.9%). Mean SA scores were 0.5% for peak vertical loading rate (3.11.7%), mean vertical loading rate (3.42.1%), peak vertical forces (2.92.2%), as well as vertical stiffness (5.23.5%) and leg stiffness (2.51.5%). Throughout a 30-min running time trial, there were consistently low-to-moderate mechanical asymmetries for spatiotemporal variables, kinetics, and spring-mass model characteristics.

**Key Words:** Symmetry angle scores, Asymmetry, Pacing, Running mechanics, Ground reaction forces

Abstract ID: BT010

### Enhancing Curling Performance: Strength and Stability Training for the Forward Sliding Technique

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The sport of curling involves two fundamental techniques: delivery and sweeping. Proficient execution of the forward sliding phase within the delivery technique is crucial for achieving optimal results. Minor deviations during the forward sliding phase can significantly impact accuracy, highlighting the critical role of muscle strength and joint stability in maintaining balance. Existing research emphasizes the importance of these factors in athletic performance, but specific studies on curling are limited. This study aims to bridge this gap by focusing on strength and conditioning, particularly related to the sliding phase, to optimize the performance of curlers. Sliding distance is a reliable measure

of lower limb strength and stability in curlers. Participants underwent a thorough warm-up before preparing in a crouched position at the hack, holding a brush in the left hand and a curling stone in the right hand. The body weight was shifted backward, the left leg was extended behind, and the sliding leg pushed off the starting block to achieve a smooth forward slide. The distance from the front edge of the starting area to the tip of the sliding foot was measured and recorded, with each participant performing three trials, and the best result was recorded to the nearest 0.1 cm. To analyze joint movements and muscle activation, wireless sensor nodes were attached to six key joint locations: the hips, knees, and ankles on both sides. The sliding actions were recorded, and motion patterns were analyzed using Dartfish video analysis software. Data analysis was performed using Excel and SPSS, with independent sample t-tests conducted to determine significant factors affecting performance during the sliding phase. The analysis showed that lower limb muscle strength and stability are crucial during the sliding phase. EMG data indicated that the activation of the quadriceps, gluteus maximus, gluteus medius, and gluteus minimus muscles was significantly correlated with sliding stability ( $r = 0.76$ ,  $p < 0.01$ ). Joint angle analysis revealed that greater hip abduction (mean angle: 45 degrees) and knee flexion (mean angle: 60 degrees) were associated with better balance and reduced deviations in the sliding path ( $p < 0.05$ ). Additionally, the external rotation of the foot during sliding (toe-out angle between 30 and 60 degrees) contributed to greater stability. Therefore, training plans should focus on enhancing joint flexibility, range of motion, and the strength of related muscle groups. To optimize stability and improve performance during the sliding phase in curling, flexibility training should be incorporated, focusing on enhancing the flexibility and stability of the hip, knee, and ankle joints. Specific exercises, such as land simulations with a toe-out angle of 45 degrees, should be included. Targeted strengthening of the quadriceps and gluteus maximus can significantly enhance stability and performance during sliding. These findings provide practical insights for designing effective training programs aimed at improving stability and performance during the sliding phase for curlers.

**Key Words:** Curling, Strength, Forward slide, Sports biomechanics, Stability

Abstract ID: BT124

### An Analysis of the Kinetics of the Tango Walk for College Dance Students

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The purpose of this study is to analyze the technical characteristics of the tango walk action through kinematic testing methods and means for college sports dance students, in order to obtain the differences between professional and non-professional students in this action and explore the teaching focus and difficulty of the action. It also provides relevant reference for injury prevention. 30 college students (15 professional students and 15 non-professional students) were tested for the tango walk action using the 8-camera infrared



optical motion capture analysis system (BTS Bioengineering). (1) The knee joint flexion angle of the non-professional group is smaller than that of the professional group, and the knee joint angle is in a flexed state throughout the movement, with a significant difference ( $P < 0.05$ ). (2) There is no significant difference in hip joint angle between the two groups in each stage of the walk action, but the hip joint swing amplitude gap is large ( $P < 0.05$ ). (3) Both groups exhibit plantarflexion of the ankle joint in each stage of the walk action. (4) There is no significant difference in shoulder abduction, flexion, and elbow flexion and internal/external rotation angles in each stage. (5) From the perspective of time characteristics, the professional group's time share in the entire walk action is significantly smaller than that of the non-professional group. Conclusion: (1) Maintaining a forward leaning position makes it easier to increase the distance between steps and highlight the beauty of the movement. (2) In the non-professional group, the knee joint flexion angle was all below 0 degrees at the moment of movement, with overextension, which is prone to injuries of the anterior cruciate ligament and knee joint. (3) Maintaining stability of the shoulder joint is very important. Once there is internal rotation of the shoulder joint, it will cause up and down fluctuations in dance movements. (4) Maintaining ankle plantarflexion for a long time to maintain body posture makes the lower limbs and ankle joint stronger, and the movement range is larger.

**Key Words:** College Ballroom Dance, Tango, Kinesiology, Walk Movement

Abstract ID: BT178

### Assessing the Influence of Foot Arch and Running Shoe Design on Running Impact Forces: A Regression Analysis

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This study aimed to explore the contribution of foot arch structure and running shoe construction to landing impact during running. Thirty-one healthy students were recruited to run 50 m at a fixed speed (3.305% m/s) and peak tibial axial acceleration (PTA) was continuously measured using an inertial sensor. Meanwhile, foot shape was scanned in standing and seated postures using a three-dimensional scanner for obtaining arch height, dorsum height, arch height index (AHI) and arch stiffness index (ASI), and their running shoe was measured using a caliper for obtaining heel stack height (HSH), heel-to-toe drop (HTD) and heel elevation angle (HEA). Multiple linear and stepwise regression analyses were run to predict PTA from foot arch (AH, AHI and ASI) and running shoe (HSH, HTD and HEA). The results showed significant correlations between the AHI ( $p < 0.05$ ), ASI ( $p < 0.05$ ), and PTA during running. Additionally, ASI was negatively correlated with PTA, suggesting that lower arch stiffness (i.e., higher ASI values) may reduce landing impact. Furthermore, the construction features of running shoes, specifically HSH, HTD, and HEA, also correlated significantly with PTA. Decreases in HSH ( $r = -0.44$ ,  $p = 0.012$ ) and HTD ( $r =$

$-0.36$ ,  $p = 0.049$ ), along with an increase in HEA ( $r = -0.35$ ,  $p = 0.05$ ), were associated with a decrease in PTA, suggesting that these shoe characteristics may influence the impact forces experienced during running. This study shows that foot arch structure and running shoe design significantly influence running impact forces. Specifically, the AHI, ASI, HSH, HTD, and HEA are all significantly correlated with landing impact.

**Key Words:** Foot Arch Structure Features, Running Shoes Sole Shape, Landing Impact

Abstract ID: BT198

### The Influence of Light-Triggered Reaction Time Rapid Walking on the Stability of Gait Initiation in the Elderly

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Incorrect transfer of body weight during walking is a primary cause of falls in the elderly, with walking speed serving as a predictive indicator for fall risk. Gait initiation, involving complex movements such as body weight transfer, is considered an ideal task for assessing fall risk in the elderly. This study aims to quantify and compare the dynamic stability control differences in older adults with different physical activity habits when walking at self-selected speeds and rapidly walking under time constraints, exploring the potential influence of these habits on fall risk. 19 regularly practiced Tai Chi (65.58 3.63 years, 1.58 0.43 m; 60.94 7.27 kg), 19 regularly participated square dancing (64.68 4.41 years, 1.59 0.04 m, 60.90 4.29 kg), and 17 with a Sedentary behaviour (65.59 3.66 years, 1.620.53 m, 65.41 12.25kg) elderly women were observed. Each participant underwent two types of tests: self-initiated walking, Light-Triggered reaction time rapid walking, each performed five times. Kinematic data were captured using eight 3D high-speed cameras, kinetic testing was conducted on four Kistler force plates. The study compared the characteristics of the margin of stability and foot placement strategies. Data were statistically analyzed using multifactorial repeated measures. Significant differences were observed in the mediolateral direction stability at the beginning and end moment of the step ( $p < 0.01$ ), anteroposterior direction stability at the end of the step ( $p < 0.01$ ), stride length ( $p < 0.01$ ), stride width ( $p < 0.01$ ), and foot progression angle ( $p < 0.05$ ) among elderly individuals with different exercise habits. Exercise habits can influence the stability and foot placement strategies of gait initiation in elderly individuals. Tai Chi practice can enhance the stability of rapid walking and foot placement strategies during gait initiation.

**Key Words:** gait initiation, dynamic stability, margin of stability

## Study on Plantar Pressure Distribution Characteristics of BareFoot Running and Shoe Running

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To explore the distribution characteristics of plantar pressure and the risk factors of injury in the supporting stage of barefoot running and shoe running to provide a theoretical basis for developing reasonable jogging movement technology and preventing injury. In this study, 51 male undergraduates were tested by footscan plantar pressure distribution test system to collect the plantar pressure data in running with shoes and bare feet. (1) The maximum pressure occurs in the middle of the forefoot, i.e. the 2nd metatarsal region, followed by the first metatarsal, third metatarsal, calcaneus, first toe, fourth metatarsal, and the fifth metatarsal. The maximum pressure value in the barefoot run also occurs in the 2nd metatarsal, Then the calcaneus, the first metatarsal, the third metatarsal, the first phalanges, the fourth metatarsal and the fifth metatarsal; (2) The maximum impulse when running with shoes is in the 2nd metatarsal bone, then, the 1st metatarsal, 3rd metatarsal, hallux, 4th metatarsal, 5th metatarsal, and finally the calcaneus. In the bare-foot run, The maximum impulse occurs in the 2nd metatarsal, Then the first metatarsal, third metatarsal, 1st phalanx, calcaneus, 4th metatarsal and 5th metatarsal. Except for the 4th metatarsal region, the peak pressure and maximum impulse were significantly greater than shoe running. The medial anterior part of the foot is the most important part to bear the impact load when running with shoes, while the heel and medial anterior part of the foot are the main parts to bear the impact load when running with bare feet. These parts are also the places where excessive fatigue occurs easily. The impulse is relatively large in the 2nd, 1st and 3rd metatarsal areas, whether running with shoes or barefoot running. These regions are the most common places for jogging chronic diseases, especially barefoot running; in addition, the force on the inside of the foot is much larger than the outside of the foot, and the increase of the inside pressure has a certain relationship with the foot varus sprain.

**Key Words:** jogging, plantar pressure, maximum pressure, impulse

## A Longitudinal Analysis of the Techniques and Tactics of Excellent Table Tennis Player Fan Zhendong

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This article takes the important confrontation between Chinese excellent table tennis player Fan Zhendong and Ma Long in intercontinental competitions from 2016 to 2022 as an example, and analyzes Fan Zhendong's technical and tactical use in recent years using the methods of literature, video observation,

four stage index evaluation, technical efficiency, and TOPSIS. The research results show that: 1. The overall trend of Fan Zhendong's technical status from 2016 to 2022 shows a positive "U" shape. The overall trend decreased from 2016 to 2018, and gradually increased from 2019 to 2022. 2. The technical and tactical characteristics of Fan Zhendong from 2016 to 2018 are as follows: the average scoring rate of the starting and snatching stages is evaluated as passing, and the average utilization rate is medium. Among them, the score is mainly in the third beat, and the connection between the third and fifth beats is weak; The average score rate of the snatching section is good, and the average usage rate is medium. Its main score is concentrated in receiving and attacking the serve directly, and the connection between the second and fourth rackets still needs to be strengthened; The average score rates of the first and second stages of the stalemate are pass and good, respectively, and the average usage rate is medium. Its active stalemate ability is stronger than its passive stalemate ability. 3. The technical and tactical characteristics of Fan Zhendong from 2019 to 2022 are as follows: the average score rate in the starting and snatching stages is passing, and the average utilization rate is low. It mainly scores in the third shot, but there are many mistakes in the fifth shot, and the ability to connect the third and fifth shots needs to be strengthened; The average score rate of the snatching section is good, and the average usage rate is medium. The main score is the fourth racket, and the receiving and serving techniques are also becoming more perfect; In the stalemate stage, the average score rate of stalemate stage I and stage II is good, and the average usage rate is high and medium, respectively. Its active stalemate ability is stronger than its passive stalemate ability, and the average score rate and usage rate during the stalemate period have improved compared to 2016-2018.

**Key Words:** Fan Zhendong, Ma Long, TOPSIS method, technical and tactical analysis, four-stage index evaluation method

## The effects of different types of whole-body vibration intervention on static balance for children with developmental coordination disorder

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The object of this study is to compare the effect of two types of whole-body vibration (WBV) on static and balance for children with developmental coordination disorder (DCD). Thirty children with DCD age 9- to 12-year-old were recruited. Different vibration types (vertical synchronized (VS), and side-alternating (SA)) were employed in WBV intervention. Participants were randomly assigned to VS-WBV group, SA-WBV group, or control group (10 participants in each group). Children with DCD in the VS-WBV and SA-WBV groups received a 3-month WBV intervention. Participants all perform a static balance test two times: a pre-intervention test, and a post-intervention test. Center of pressure (COP) sway was measured for static balance test (standing still

on two legs and single leg on a force plate for 10s). A Group (3 levels) x Test Time (2 levels) mixed design repeated measures ANOVAs was used for analysis. Significance level is set at  $p < 0.05$ . The results showed, in the pre-intervention test, that there were no differences regarding COP sway among groups. However, in the post-intervention test, children with DCD in the SA-WBV group have a significantly lower amount of COP sway during the execution of the static balance test compared with those children in the VS-WBV group and control group. SA-WBV intervention leads to greater effects on improving static balance performance as compared to VS-WBV intervention for children with DCD.

**Key Words:** Whole-body vibration intervention, vibration type, developmental coordination disorder, static balance

Abstract ID: ES014

### A Cultural Impact on Team Snacks in Youth Sports

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To evaluate the quantity and quality of nutrition received by recreational youth sport participants before, during, and after games in a diverse, culturally unique population in Hawaii. The secondary aim was to compare the current finding with a previously reported population. Data were collected by observing youth basketball teams (N=249) and recording food provided to athletes ages 5 to 13. The nutrition facts for each snack were obtained through USDAs Food Data Central database. Nutrition facts included total Calories, protein, fats, carbohydrates, added sugar, sodium, and fiber. Results indicated that the average total Calories provided were 590 256 Calories per child per game. On average, this included 90.3 39.9 g of carbohydrate (32.3 19.5 g of added sugars), 19.3 10.4 g of fat, 12.7 8.5 g of protein, 3.45 2.38 g of fiber, and 820 403 mg of sodium. Compared to a previously reported study, multiple One-Sample t-Tests revealed the current studys population had significantly greater amounts of Calories (Mean Difference = 377, (t(248) = 23.2,  $p < 0.001$ , Cohens  $d = 1.47$ ), carbohydrate (MD = 50.4 g, (t(248) = 19.9,  $p < 0.001$ , Cohens  $d = 1.26$ ), added sugar (MD = 5.91 g, (t(248) = 4.77,  $p < 0.001$ , Cohens  $d = 0.30$ ), fat (MD = 13.5 g, (t(248) = 20.5,  $p < 0.001$ , Cohens  $d = 1.30$ ), protein (MD = 10.9 g, (t(248) = 20.3,  $p < 0.001$ , Cohens  $d = 1.29$ ), fiber (MD = 2.75 g, (t(248) = 18.2,  $p < 0.001$ , Cohens  $d = 1.15$ ), and sodium (MD = 601 mg, (t(248) = 23.5,  $p < 0.001$ , Cohens  $d = 1.49$ ). These results reveal a potential cultural impact on the nutrition in team snacks provided to youth sport participants. Future research should recognize cultural differences when developing interventions aimed at the food environment.

Key Words: Nutrition, Diverse, Recreational, Caloric Intake

Abstract ID: ES030

### Upper Limb Stretch Reflex Dynamics in Judo Athletes

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When judo athletes engage in close proximity, it is critical to react quickly to an unpredictable disturbance from the opponent. Therefore, not only voluntary reactions but also reflexive actions must be swiftly recruited in the rapid changes of motion that occur during a match. Thus, judo athletes would have the specific characteristics of a quick response system (i.e., reflex). This study aimed to clarify the characteristics of the upper limb stretch reflex in judo athletes. Fifteen judo athletes and 15 control subjects participated in this study. The judo athletes had experience of judo for more than five years. The control participants were individuals who did not exercise regularly. The experiment was divided into two sessions. The EMGs of the right biceps brachii (BB) and the triceps brachii (TB) were recorded with bipolar surface electrodes 40 mm in diameter (Vitrode M, Nihon Kohden, Japan) with an inter-electrode distance of 40 mm. We saved data of the EMG signal, torque, angle and angular velocity in PC software (Labchart ver.8, AD instrument, USA) through an A/D converter (ML880 PowerLab 16/30, AD instrument, USA). In the Flexion task, participants either relaxed or flexed the elbow when they felt a perturbation (abrupt elbow extension induced by a dynamometer). In the Extension task, participants relaxed or extended the elbow when they felt a perturbation (abrupt elbow flexion). During the tasks, the stretch reflex was monitored by recording the surface electromyographic (EMG) activities of the right biceps and triceps brachii. The EMG reflex components were divided into three periods based on the time after the perturbation by following the definition of Yamamoto and Ohtsuki (1989): M1 = 20 - 50ms, M2 = 50 - 80ms, and M3 = 80 - 100ms. In the Extension task, judo athletes showed significantly stronger stretch reflex of the triceps brachii at the M3 component compared to the control group ( $p = 0.035$ ), with no difference in M1 ( $p = 0.120$ ) and M2 ( $p = 0.078$ ). Similarly, in the Flexion task, judo athletes had significantly stronger stretch reflex of the biceps brachii at the M3 component compared to the control group ( $p = 0.010$ ), with no difference in M1 ( $p = 0.120$ ) and M2 ( $p = 0.078$ ). Our results suggest that experienced judo athletes enhanced their long latency stretch reflex in the triceps and biceps brachii.

**Key Words:** stretch reflex, judo, upper limb, motor control

Abstract ID: ES091

### Effects of an 8-Week Mobile-Based Walking Program on Depression, Perceived Stress, and Affectivity in College Students

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The well-being of college students has come under increasing scrutiny due to prevalent mental health issues such as depression and stress. This study investigates the effects of an 8-week mobile-based walking program on the mental well-being of college students, focusing on changes in their levels of depression, perceived stress, and both positive and negative

affectivity. A total of forty-three college students were randomly assigned to one of two groups to ensure equal distribution and minimize bias: a walking group (n = 23) and a control group (n = 20) with no specified activity. Upon enrollment, participants were given a unique identifier, which was used to enter participants into an online randomization tool (<http://www.randomization.org>). The intervention group participated in guided walking sessions three times a week, each lasting approximately 20 minutes, over an eight-week period. Mental health assessments were conducted using the PHQ-9 for depression, the PSS for perceived stress, and the PANAS for positive and negative affectivity. Data analysis included frequency and descriptive statistics, independent sample t-tests, paired t-tests, and a 2 (time) x 2 (group) repeated measures analysis of variance. Initial demographic characteristics showed no significant differences between the groups ( $p > .05$ ). The analysis revealed significant effects of time on perceived stress ( $F_{1,41} = 10.84, p = .002; p = .21$ ) and negative affectivity ( $F_{1,41} = 119.30, p < .001; p = .74$ ), along with significant interaction effects for negative affectivity ( $F_{1,41} = 64.478, p < .001; p = .61$ ). Further, the walking group exhibited significant reductions in perceived stress levels ( $p = .49, \text{Cohens } D = .27$ ). However, no significant differences were found in depression and affectivity scores across time for the walking group ( $p > .05$ ), and the control group showed no significant changes. This study highlights the potential benefits of an 8-week mobile-based walking program on certain aspects of the mental well-being of college students. Specifically, the findings demonstrate significant reductions in perceived stress and negative affectivity among participants in the walking group compared to those in the control group. However, the walking program did not produce significant changes in depression levels or positive affectivity. These results suggest that while a structured walking regimen can effectively reduce stress and negative emotions, it may not be sufficient as a standalone intervention for alleviating depression or enhancing positive emotions.

**Key Words:** mental health, low-intensity exercise, depressive symptoms, young adults

Abstract ID: ES094

### Effect of aerobic exercise combined with resistance training on limb blood pressure and arterial stiffness in obese and overweight adults

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The purpose of this study was to investigate the effects of a 12-week program combining aerobic exercise with resistance training on vascular function parameters in overweight and obese adults, specifically focusing on blood pressure of the extremities, ankle brachial index (ABI), and brachial-ankle pulse wave velocity (baPWV). The study consisted of 122 eligible subjects with excessive body fat, divided into three groups based on their exercise frequency: less than once per week, once to twice a week, and two or more times per week. This study includes 45 males (36%), with an average age of 40.58.2 years and a body fat percentage of 28.54.5%. There were 77 females,

accounting for 64%, with an average age of 41.27.5 years and a body fat rate of 34.74.8%. The aerobic training involved 15 minutes of incremental power cycling and 20 minutes of high-intensity interval rowing. Resistance training was conducted with increasing loads from 50% to 80% of maximum capacity. Measurements of body shape and vascular function were taken at weeks 0, 7, and 13 post-intervention. Statistical analyses included one-way analysis of variance for group comparisons and repeated measures analysis of variance paired with paired sample t-tests for within-group changes. The study found that after 6 and 12 weeks, the combined exercise program significantly reduced BMI (male:  $p=0.038$ , female:  $p<0.001$ ) and visceral fat area (male:  $p=0.042$ , female:  $p<0.001$ ) in both men and women. It also improved body weight (6 weeks:  $p<0.001$ , 12 weeks:  $p=0.009$ ), body fat mass (6 weeks:  $p<0.001$ , 12 weeks:  $p=0.002$ ), and body fat percentage (6 weeks:  $p<0.001$ , 12 weeks:  $p=0.002$ ) in women, with no significant effect on muscle mass. While the training did not significantly affect blood pressure and arterial stiffness in men, it did reduce systolic and diastolic blood pressures at certain points in women. Subjects exercising more than twice a week showed a higher reduction in extremity blood pressure compared to those exercising less frequently. Changes in body composition were associated with changes in blood pressure and baPWV. The study suggests that the combined aerobic and resistance training may influence limb blood pressure and arterial stiffness independently of changes in body composition, with a more pronounced effect in women. An increase in exercise frequency was linked to better blood pressure outcomes. Future research is recommended to explore the long-term health effects of different exercise types and frequencies, considering gender differences.

**Key Words:** Limb blood pressure, Ankle brachial index, Brachial ankle pulse wave velocity, Obesity

Abstract ID: ES105

### Analyzing the Winning Indicators of Chinese Women's Professional Basketball League Based on Machine Learning Models

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The purpose of this study is to determine how wins and losses in the Chinese Women's Basketball League are affected by key technical-tactical indicators. The sample consisted of 681 games, and the relevant technical-tactical indicators variables were recorded and analyzed through the official website of the Chinese Women's Professional Basketball League. Binary logistic regression models revealed the most relevant variables to the game results. The decision tree model more comprehensively analyzed how the independent variables affected the outcome of the matches. During the regular season phase, the technical-tactical indicators that had the most significant impact on game wins and losses were filtered out by using binary logistic regression modelling, namely successful 2-point field goals, successful 3-point field goals, successful free-throws, unsuccessful 2-point field goals, steals, defensive



rebounds, points from turnover, and home/away. In the playoff phase, the variables screened by binary logistic regression were successful 2-point field goals, successful 3-point field goals, successful free-throws, offensive rebounds, steals, defensive rebounds, points from turnover. offensive rebounds, steals defensive rebounds, points from turnover.

Finally this study used decision trees to more fully analyze the variables screened by binary logistic regression. The analysis found that in the regular season phase, the majority of teams if they want to win. Teams have to make more than 21 two-point field goals and have more than 25 defensive rebounds. In the playoff phase, most teams would have to hit more than 24 two-point shots to win the game. The study found that in the regular season, a lot of teams must make more than 21 two-pointers and 25 defensive rebounds to win a game. In the playoffs, the number of two-pointers made is even more important, with most teams having to make more than 24 two-pointers to win a game.

**Key Words:** Limb blood pressure, Ankle brachial index, Brachial ankle pulse wave velocity, Obesity

Abstract ID: ES111

### Effects of Plyometric Training on the Movement Speed among Youth Male Basketball Players

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Movement speed is crucial for basketball performance, especially in youth athletes who are developing their physical and skill abilities. Plyometric training (PT) and resistance training (RT) are recognized methods to enhance athletic performance. PT focuses on explosive power, while RT targets muscular strength and endurance. However, the comparative effects of these training methods on movement speed in youth male basketball players are not well understood. This study aims to fill this gap, providing insights to optimize training programs for young athletes. This study aimed to compare the impact of a 12-week plyometric training (PT) program versus a resistance training (RT) program on various speed-related performance metrics in 13-15-year-old male basketball players. Thirty-six male basketball players with over two years of National Youth Club training experience were randomly assigned to either the PT group or the RT group for a 12-week training program. Performance assessments included 10m and 20m sprints, 46m shuttle run, four-line shuttle run, triangular sliding step, full-court dribble layup, and full-court integrated dribble tests. Data were analyzed to determine the significance of performance improvements within and between groups. The PT group showed significant improvements in the 20m sprint ( $p < 0.001$ ), 46m shuttle run ( $p < 0.001$ ), four-line shuttle run ( $p = 0.003$ ), triangular sliding step ( $p < 0.001$ ), full-court dribble layup ( $p = 0.003$ ), and full-court integrated dribble ( $p < 0.001$ ). No significant change was observed in the 10m sprint for either group. When comparing between groups, no significant difference was found in the full-court integrated dribble ( $p = 0.505$ ). However, significant differences favoring the PT group were found in the 46m shuttle run ( $p = 0.042$ ), triangular sliding step ( $p = 0.044$ ), and four-line shuttle run ( $p = 0.033$ ). Both

plyometric and resistance training effectively enhance movement speed among youth basketball players. plyometric training was more effective in enhancing agility and movement speed, as evidenced by the superior performance in the 46m shuttle run, triangular sliding step, and four-line shuttle run. These findings suggest that incorporating plyometric exercises into training regimens can significantly improve speed-related attributes essential for basketball performance.

**Key Words:** Plyometric, Resistance training, Basketball, Youth, Fitness test

Abstract ID: ES127

### Voluntary Wheel Running and Acetic Acid Supplement Failed to Attenuate Ovariectomy-induced Decline in Hippocampus Mitochondrial Function in Mice

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Postmenopausal women are at higher risk for the neurological dysfunction down-regulating cognitive and whole-body metabolic function. Hippocampus and hypothalamus play a critical role in regulating cognitive and whole-body metabolic function, respectively. Acetic acid supplement and aerobic exercise may attenuate the menopause associated with mitochondrial dysfunction in hippocampus and hypothalamus. The purpose of the present study was to investigate menopause decreases mitochondrial function in hippocampus and hypothalamus, and the combined treatment with acetic acid supplement and aerobic exercise can attenuate the menopause-associated mitochondrial dysfunction in hippocampus and hypothalamus. This 15-week study used female C57BL/6J wild type mice ( $n=40$ , 8 weeks old), which were randomly assigned to Sham (SHM), ovariectomy (OVX), ovariectomy with exercise (OVXE), ovariectomy with acetic acid (OVXA), and ovariectomy with exercise and acetic acid (OVXAE) groups. Fat/lean mass, whole-body metabolic rate, and mitochondrial function were assessed using dual-energy x-ray absorptiometry, indirect calorimetry, and OROBOROS O2K, respectively. Lean and fat mass did not differ between groups. Metabolic rate was significantly greater in SHM than other groups. While mitochondrial function in hypothalamus did not differ between groups, in hippocampus, OVX, OVXE, OVXA, and OVXAE were significantly lower than SHM (all  $P < 0.05$ , 320.943.3, 239.323.4, 233.819.1, 234.728.2 and 244.422.0  $\text{mol} \cdot \text{sec}^{-1} \cdot \text{mg}^{-1}$ , SHM, OVX, OVXE, OVXA, and OVXAE, respectively). Ovariectomy decreased mitochondrial function in the hippocampus but not in hypothalamus. Acetic acid supplement and voluntary wheel running, and those combined treatments failed to attenuate the ovariectomy-associated decline in mitochondrial function in hippocampus. Ovariectomy-induced estrogen deficiency showed a strong, negative effect on hippocampus mitochondrial function independent of acetic acid supplement and voluntary wheel running treatment. Future studies are needed to investigate the underlying mechanisms of oxidative stress and mitochondria-related proteins such as PGC1 $\alpha$ , oxidative phosphorylation complexes.

**Key Words:** Menopause, Hippocampus, Acetic acid, Voluntary wheel running, Mitochondrial function

Abstract ID: ES133

### **The effect of Sprint Interval Training on Glucose and Lipid Metabolism**

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Sprint Interval Training (SIT) involves exercise intensity meeting or exceeding 100% VO<sub>2</sub>max. This study provides a review of SIT's effects on glucose and lipid metabolism, and outlines future research trends in this area. Relevant literature published in the past 8 years was searched in bibliographic databases at home and abroad resulting in 424 articles. After screening and organization using EndNote software, 14 articles were selected. 1) Four studies indicate that SIT activates AMPK in skeletal muscles, enhancing transcription and translocation of Glucose Transporter Type 4 (GLUT4) and improving insulin sensitivity, leading to prolonged training effects to expectantly reduce central obesity. 2) SIT stimulates submaximal fat oxidation during exercise, reduces fat mass, and aids in treating Non-alcoholic Fatty Liver Disease (NAFLD). 3) Comparative studies reveal gender-specific responses, with women showing more significant VO<sub>2</sub>max increases and men experiencing greater reductions in body fat. 4) Most commonly used SIT intervention is for 6 weeks, 3-4 sessions per week, 4-6 sets of 30-second all-out sprints on cycle ergometers. SIT can improve body composition and glycolipid metabolism in overweight people. Future research should focus on SIT's gender differences, exercise risk assessment and population suitability, aiming to maximize exercise efficiency.

**Key Words:** Sprint Interval Training, Glucose metabolism, Lipid Metabolism, Moderate Intensity Continuous Training, exercise efficiency

Abstract ID: ES191

### **Effects of Exergaming Intervention on Overweight and Obese Children with and without Parents Participations**

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With the rise in physical inactivity, overweight and obesity among children, hence, the children-oriented exercise such as exergaming intervention which are commonly imposed as a standard workout routine has not been able to address this issue. On the other hand, parental involvement in organised sports has been shown to increase children's participation in sport. Therefore, amalgamating these two factors may be an effective strategy to increase exercise participation to improve fitness in children. This study aimed to investigate whether parents

supervision may alter the effectiveness of exergaming exercise regimen specifically designed for children who are overweight and/or obese to improve their fitness levels. A total of 18 overweight or obese children aged 7-12 were recruited and randomly divided into the parent supervision group or non-supervision group. They underwent a 6-week exergaming intervention for 3 times a week, for 30 minutes in each session, with the intensity set to moderate in the software. Before and after the intervention, the following were measured: body mass index (BMI), cardiovascular fitness: 20-m shuttle run test (SRT), muscular strength: handgrip dynamometer test, power: standing broad jump (SBJ), flexibility: sit and reach (SR), agility: T-Test (TT) and balance: Single leg Y test (SLY). A two-way repeated ANOVA showed significant time effect in all measurements, with BMI, SRT, and TT time reducing while everything else increased in both groups. Interestingly, time x group interaction effects were detected in SRT, SR, and SLY with multiple comparisons in favor of the supervision group. The results show that exergaming is effective in improving fitness level in overweight and obese children, with parental participation being able to further improve its effectiveness compared to no supervision, specifically in speed, flexibility, and balance. Future studies could administer longer intervention periods and larger sample size.

**Key Words:** exergaming, parental participation, children, obese, overweight

Abstract ID: ES192

### **Plyometric Training Effect on Vertical and Horizontal Power Development in Artistic Gymnast Under 12-Year-Old**

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Artistic gymnastic discipline is a sport that demands a high level of power and flexibility to excel in their performance. Both vertical and horizontal power are primary components that are required in executing challenging routines in the sport. While plyometric training has been shown to improve artistic gymnastic performance, there is lack of data comparing both vertical and horizontal power among young gymnasts, particularly among elite Malaysian teams. This study aimed to investigate the effect of plyometric training on vertical and horizontal power in artistic gymnasts under 12 years old. Twenty-six artistic gymnasts (age: 11.4 ± 0.9 years) participated in this study and were randomly assigned to two independent groups; the plyometric training group (PTG) undertook a six-week plyometric program, involving a 45 min of plyometric incorporated into their usual training for five times a week, while the control group (CG) carried out their usual artistic gymnastic training. The MyJump 2 App, Android version, was used to record videos of vertical jump test (VJ), countermovement jump (CMJ), horizontal jump (HJ) and drop jump (DJ) to assess jump height, power (W), force (N), contact time (CT), flight time (FT) and distance. The data collected was analysed using ANCOVA where pre-test was determined as a covariate. No significant main effect was found in all variables measured after the 6-week intervention. However, there were

large effect size in the post-test jumping height ( $\eta^2=0.97$ ), VJ power ( $\eta^2=0.97$ ) and force ( $\eta^2=0.98$ ), CMJ power ( $\eta^2=0.97$ ) & force ( $\eta^2=0.99$ ), and horizontal jump distance ( $\eta^2=0.71$ ), where PTG showed higher values. PTG has greater potential in improving vertical and horizontal power performances in the 6-week intervention period. Due to limitations, a longer study period is suggested for future studies.

**Key Words:** rhythmic gymnastics, children athletes, plyometric training, jump power

Abstract ID: ES209

### The impact of aerobic exercise intensity and age on muscle oxygenation in non-exercising skeletal muscle

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To study the effects of a Short Physical Performance Battery (SPPB) on muscle oxygenation of the Vastus Lateralis in older adults before and after participating in a community dance program. 14 older adults (dance program, n=6) & (control group, n=8) (62-83 yo) participated in the 8-week community dance program (CDP) study, 1 session per week, which was conducted at senior activity centres. All participants performed the SPPB, before and after the CDP, which included the side-by-side stand, semi-tandem stand, tandem stand, gait speed, single chair stand and repeated chair stands. Muscle oxygenation was quantified from the right Vastus Lateralis muscle with a near infrared spectroscopy (NIRS) device (MOXY, USA), during, and up to 15 mins after the SPPB test. Muscle oxygenation data was averaged over the last 15 secs before the commencement of the test, end of every SPPB component, and at every min post-test, then analysed using mixed-model ANOVA (SPSS, Version 29). There was a significant main effect of time ( $p<0.001$ ), but no interaction between intervention X time X group ( $p=0.351$ ). Regardless of intervention, muscle oxygenation was significantly decreased, during tandem stand ( $p=0.037$ ), gait speed test ( $p=0.002$ ), chair stand test ( $p<0.001$ ) and repeated chair stand ( $p<0.001$ ), and remained low, as compared to baseline, for up to 13 minutes post-exercise ( $p<0.05$ ). This is the first report examining the effect of performing a geriatric functional test on intramuscular oxygenation. Our results suggest that muscle oxygenation is sensitive to changes in functional tests and during the recovery phase. Muscle oxygenation is a clinically useful parameter that provides insights into physiological performance of an older adult performing the SPPB, as well as the efficacy of interventions. Future interventions, such as increasing the dance program workload, can be used to examine their effect on muscle oxygenation. Given the ceiling effects of many functional tests, the inclusion of a physiological measurement will provide objective assessments of changes in performance.

**Key Words:** Tissue oxygenation, Exercise recovery, Aging, Hyperoxygenation, Dance intervention

Abstract ID: ES226

### Effect of 8 weeks Combined Hypoxic and Normoxic Repeated-Sprint Training on Aerobic and Anaerobic Capacities among Male Netball Players

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To investigate the effect of 8 weeks of combined hypoxic and normoxic repeated-sprint training on aerobic and anaerobic capacities among male netball athletes. Over an 8-week period, 14 male netball players (age: 30.7 yrs; 71.3 ± 11.7kg; 175.0 ± 7.3 cm) were assigned into Hypo-Normo (n=7) and Normo Hypo (n=7) groups. Hypo-Normo group underwent a 4-week repeated-sprint training (RST) in hypoxic (Hypo) (FiO<sub>2</sub>=16.5%) followed by a 4-week RST in normoxia (Normo) (FiO<sub>2</sub>=20.9%) conditions; whereas Normo-Hypo group underwent a 4-week RST in normoxia followed by hypoxic conditions. The RST sessions consisted of 3 sets of 5, 6-s all-out repeated sprints interspersed with 24-s active recovery at 50W, followed by a 5-min recovery period at 50W between sets. Heart rate (HR) and oxygen saturation (SpO<sub>2</sub>) were recorded during training using a pulse oximeter (Nonin 9590) after each sprint. Countermovement jump, 20-m sprint, 20-m shuttle run, and 30s wingate anaerobic test were tested during pre- and post-test. Results showed there was no significant improvement in jump height, speed, peak power, fatigue index, and estimated VO<sub>2</sub>max in both Hypo-Normo and Normo-Hypo groups after 8 weeks of RST ( $p>0.05$ ). Eight weeks of RST in a combined hypoxic and normoxic environment unlikely improved anaerobic and aerobic capacities in male netball athletes.

**Key Words:** Repeated-sprint training, hypoxia, sprint, countermovement jump, aerobic performance

Abstract ID: MG26

### Examining the Sports Values and Future Preferences of Korean Citizens

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Sports are essential in modern society for national pride, public health, and social integration, forming dynamic relationships with various social institutions (Veal, 1997). Consequently, sports policy formulation extends beyond promoting activities to enhance citizens' quality of life and national competitiveness. This study analyzes public values and future preferences regarding sports through a systematic survey, offering essential

data for policy development. A literature review guided the creation of 47 items (106 detailed) to measure future sports values, referencing studies like the World Values Survey (2022) and Korea's National Assembly Futures Institute (2019-2022). The survey was conducted among 800 respondents, considering gender, age, and residence, ensuring equal gender distribution. Analysis revealed that Koreans view sports as enhancing life quality (mean 3.79/5). Future policy perceptions were positive, with recreational sports policy rated highest (mean 7.04/10). Citizens believe sports can positively impact Korea's future, improving life quality (mean 3.56/5), economic development (mean 3.19/5), cultural (mean 3.63/5), and welfare levels (mean 3.43/5), public health (mean 3.7/5), and international contributions (mean 3.46/5). More detailed results will be discussed at the conference. Major issues impacting future sports policies include population structure changes, economic shifts, and technological advancements. The public perceives sports policies should be government-led, particularly in elite and recreational sports. While sports' social integration function is viewed positively in resolving conflicts between older and younger generations, Koreans and foreigners, and men and women, it is less so for conflicts between wealth groups, political ideologies, and employment types. This study provides foundational data for policymakers, outlining effective sports policy directions that align with public needs and expectations.

**Key Words:** Sport Policy, Public Values, Future Preferences, Social Integration

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Abstract ID: MG117

### Cultural Marketing Strategies in Sports Events

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This study aims to explore the cultural marketing strategies used in sports events and their impact on audience engagement and brand perception. The research objectives are to identify effective practices that resonate with diverse audiences and enhance the overall experience of sports events. The research methodology employs a mixed-methods approach, including both qualitative and quantitative data. Participants include event organizers, marketing professionals, and spectators from various sports events. Research tools include surveys, interviews, and observational studies to gather comprehensive insights. Through insights from participants involved in a series of case studies, including the 2008 Beijing Olympics and Li-Ning, Tsingtao Beer at the 2018 Qingdao International Marathon, Alibaba at the 2019 Hangzhou Marathon, Anta at the 2022 Beijing Winter Olympics, and Mengniu at the 2022 Hangzhou Asian Games, the impact of cultural marketing elements on audience reactions and brand loyalty is analyzed. The results indicate that integrating local cultural elements, storytelling, and interactive experiences significantly enhance audience engagement and establish stronger connections between brands and audiences. The conclusion emphasizes the importance of cultural relevance and authenticity in marketing strategies to create memorable and impactful sports events.

These findings provide valuable guidance for sports marketers to enhance audience engagement and brand loyalty through culturally informed marketing practices.

**Key Words:** cultural marketing, sports events, audience engagement, brand perception, storytelling

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Abstract ID: MG140

### Current Status of Talent Cultivation and Employment Development for Fitness Instructors in Taiwan

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The primary purpose of this article is to explore the current development status and related aspects of the fitness instructor industry in Taiwan in recent years. It aims to gain a better understanding of the future prospects for fitness instructors in Taiwan, providing valuable references for policymakers, educational institutions, and industry practitioners. This study conducted a literature review to collect data. It searched for 18 articles related to the topic from the past 20 years and employed a narrative synthesis approach. The review and analysis of the studies revealed that in terms of professional development, there are increasing opportunities for continuing education and skill enhancement, but challenges remain in standardization and quality control. Technological advancements have brought new opportunities to the fitness instructor industry, such as online coaching and the use of smart devices, while also impacting traditional service models. The COVID-19 pandemic has accelerated the digital transformation of the industry but highlighted the importance of instructors' adaptability. The research also indicated that the aging population trend has created new market demands for fitness instructors, particularly in health management for seniors. However, improving cross-linguistic and cross-cultural service capabilities remains a significant challenge for the industry. Based on the research findings, this article proposes a series of recommendations: Taiwan's fitness instructor certification model needs to strengthen certification standards and align with international standards; schools and the industry should promote industry-academia collaboration to enhance education quality; innovative service models should be encouraged to respond to market changes; and targeted policies should be formulated to support the healthy development of the industry. Future research can further explore international comparisons and long-term tracking studies to better grasp industry development trends and formulate forward-looking strategies.

**Key Words:** gym, sports center, certification, senior citizens



## Spatiotemporal Characteristics and Influencing Factors of Online Attention to Outdoor Sports in China

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Amidst the burgeoning growth of the outdoor sports industry, this research endeavors to uncover the spatiotemporal dynamics and influencing factors of online attention towards outdoor sports in China, to provide scientific guidance for the industry's sustainable development. Through an in-depth analysis of Baidu search engine index data from 2014 to 2023, this study employs sophisticated methodologies for online attention analysis and geographical spatial visualization, unveiling the dynamic shifts in online attention to outdoor sports. The results demonstrate a significant "double-peak" oscillation in online attention across time, characterized by substantial annual fluctuations and distinct seasonal variations. Geographically, online attention exhibits a gradient of decline from the eastern regions towards the central and western regions, with the regional disparities narrowing over time. The study further explores the pivotal factors that influence online attention to outdoor sports, including but not limited to geographical and climatic conditions, resource endowments, economic development levels, societal advancement, and the tourism industry's condition. The outcomes of this research provide theoretical support for strategic formulation within the outdoor sports industry and offer a reference for policymakers in their decision-making processes.

**Key Words:** Outdoor Sports, Online Attention Dynamics, Baidu Search Engine Index, Spatiotemporal Distribution Characteristics, Influencing Factors Analysis

## Research on the Competency Model of Physical Education Teachers in Rural Primary and Secondary Schools in the New Era - Taking Zhaoqing City, Guangdong Province as an Example

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The report of the 20th National Congress of the Communist Party of China proposed "Comprehensively promoting rural revitalization" and incorporated it into the framework of the new development pattern. Teachers are a key link in achieving the revitalization of rural education. In recent years, the state has attached great importance to the development of rural education. The Ministry of Education and other six departments jointly issued the "Opinions on Strengthening the Construction of Rural Teachers in the New Era", which has promoted the development of the construction of rural teachers to a certain extent. However, the construction of the teaching staff of rural primary and secondary schools still needs to be strengthened. Taking rural primary and secondary school physical education teachers as the research object, first of all, the competency factors of rural primary and secondary school physical education teachers were

initially sorted out through the literature review method and behavioral event interview method. Secondly, expert questionnaires were conducted. Then, referring to the opinions feedback from the expert questionnaire, a self-assessment questionnaire on the competency of physical education teachers was designed and distributed, and a total of 112 valid questionnaires were recovered. Finally, on the basis of conducting independent sample T-tests on the obtained data, validity tests were conducted through exploratory factor and confirmatory factor analysis, and reliability tests were achieved through Cronbach's coefficient. Eventually, a competency model of rural physical education teachers was constructed, in order to provide a theoretical reference for the training of newly recruited and in-service physical education teachers in rural primary and secondary schools, and also to provide a reference for the assessment of rural primary and secondary school physical education teachers. Research Methods: Literature review method, questionnaire survey method, and interview method. Research Conclusions: Through the research on the Competency model of rural primary and secondary school teachers, the following conclusions can be drawn: 1. There are a total of 21 Competency characteristic items for rural primary and secondary school teachers, including professional identity, self-efficacy, and sense of responsibility; kindness and patience, initiative, fairness and justice, empathy and compassion, and collaboration; emotional recognition and regulation ability, emotional support ability; professional ability of sports skills, teaching material design ability, classroom teaching and management ability, project organization and planning ability, teaching diagnosis and evaluation ability, communication and expression ability, lifelong learning ability, innovation ability; knowledge of physical education and health disciplines, educational and teaching theoretical knowledge, and psychological theoretical knowledge. The above-mentioned characteristic items can distinguish excellent physical education teachers from ordinary physical education teachers in rural middle schools. 2. The Competency characteristic items of rural primary and secondary school teachers can be divided into five dimensions. The first dimension is value and sentiment, including professional identity, self-efficacy, and sense of responsibility; the second dimension is personality traits, including kindness and patience, initiative, fairness and justice, empathy and compassion, and collaboration; the third dimension is emotional skills, including emotional recognition and regulation ability, emotional support ability; the fourth dimension is professional skills, including professional ability of sports skills, teaching material design ability, classroom teaching and management ability, project organization and planning ability, teaching diagnosis and evaluation ability, communication and expression ability, lifelong learning ability, innovation ability; the fifth dimension is knowledge literacy, including knowledge of physical education and health disciplines, educational and teaching theoretical knowledge, and psychological theoretical knowledge.

**Key Words:** New Era, Rural Primary and Secondary Schools, Physical Education Teachers, Competency Model

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Abstract ID: SC023

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**Analysis of the role of Chinese traditional sports culture on the development of modern social sports culture from the perspective of sociology**

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Chinese traditional sports culture is of great significance in promoting the development of modern social sports culture of the Chinese nation. This paper discusses the position of traditional Chinese sports culture in modern sports culture, the inheritance and innovation of values, and the role of sports culture education from a sociological point of view. This paper adopts a literature method and logical analysis method. By consulting the China Knowledge Network and reading relevant books such as Compendium of Chinese Sports History to understand the development vein, and combining with the actual situation, it explores the status quo and implementation dilemmas of the development of sports culture in the modern society from a variety of logical perspectives and puts forward the corresponding suggestions according to the existing realistic problems. Result: 1. The traditional sports culture of the Chinese nation contains a profound national spirit, and through the study of its historical evolution and inheritance, it is possible to construct a unique modern sports culture system. 2. National sports culture can enhance national and social cohesion and promote social harmony and stability. Enhance the people's self-confidence and national identity in Chinese traditional culture, establish cultural self-confidence, and build a Chinese-style modernization of traditional national sports. 3. Focus on young people's sports and cultural education, so that young people have a deeper sense of identity and inheritance of traditional Chinese sports and culture. 4. Integrate the national traditional sports culture with modern social sports culture, and analyze the importance and feasibility of inheritance and innovation. And innovate in international exchange and integrate international elements. Ethnic traditional sports culture in the innovation and constantly adapt to the development rhythm of modern society, is an important force to promote the continuous progress of modern social sports, to promote the diversified development of sports culture, has an important role in modern physical education, innovative forms of development of sports culture, and continue to provide inexhaustible impetus for the modernization of the Chinese style.

**Key Words:** Traditional sports culture, Modern social sports, sociology, innovation, education

Abstract ID: SC043

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**Theoretical Connotation, Obstructive Factors and Relief Paths for Developing High-Quality Sports Health Towns for the Aging Population**

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The purpose of this study is to explore the theoretical essence of high-quality development for Sports Health Towns within the context of a national strategy to actively address an aging population. The research aims to identify obstructive factors and propose remedial pathways to facilitate the development of Sports Health Towns that are well-integrated with health care services. The study employs a variety of methodologies, including literature review, logical analysis, and case study analysis. It examines the concept of Sports Health Towns, characterized by the organic integration of multiple sectors such as production, living, ecology, sports, agriculture, culture, tourism, and the service industry, all focused around the healthcare industry. The research also evaluates the challenges faced during the actual construction process of these towns. The analysis reveals that Sports Health Towns face several practical challenges. These include the lack of top-level planning, incomplete supervision mechanisms, a singular industrial structure, severe homogenization, inadequate social capital engagement, difficult interest coordination, a shortage of sports and health professionals, and high personnel mobility. The study finds that these issues can impede the effective development and operation of Sports Health Towns. The paper concludes with a set of suggested measures to overcome the identified challenges. It advocates for enhanced top-level design, refined town policies, improved supervision mechanisms, and accelerated industrial integration. The research promotes multi-sectoral integrated development, innovation in business models, balancing of various stakeholders' interests, establishment of talent support systems, and innovation in the training of sports and health professionals. By implementing these measures, the paper suggests that Sports Health Towns can achieve high-quality development that is well-equipped to address the needs of an aging population.

**Key Words:** Sports Health Towns, Aging Population Strategy, Multi Sectoral Integration, Development Challenges, Innovation and Policy Refinement

Abstract ID: SC181

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**Analysis of Chinese Residents' Participation in Physical Activities and Its Influencing Factors: Based on CGSS 2021 Data**

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This study aims to explore the differences in adolescent sports participation between urban and rural areas in China and their subsequent effects on physical and mental health, utilizing data from the 2021 Chinese General Social Survey (CGSS 2021). Descriptive statistics and regression analysis were conducted on the CGSS 2021 data to examine adolescent sports participation and its associated physical and mental health outcomes. The sample encompasses adolescents residing in both urban and rural areas nationwide. Sports participation was measured by the frequency of weekly sports activities, while physical and mental health were assessed through self-reported evaluations. The proportion of urban adolescents engaging in sports activities more than three times per week was 45.2%, compared to 27.8%

for rural adolescents. Urban adolescents rated their physical health as "very good" and "good" at 15.6% and 42.1%, respectively, whereas rural adolescents reported these ratings at 8.9% and 33.4%. The prevalence of anxiety and depression among urban adolescents was 12.3% and 14.8%, respectively, while for rural adolescents, it was 18.7% and 22.4%. Multivariate regression analysis, after control variables, revealed that each additional frequency of sports participation was associated with a 0.37-point increase in physical health scores and a 0.29-point increase in mental health scores for urban adolescents, and 0.31 and 0.27 points, respectively, for rural adolescents. Increasing adolescent sports participation has a positive impact on both physical and mental health, with notable differences between urban and rural adolescents. Policymakers are encouraged to address the urban-rural gap by providing more resources to promote the overall health of adolescents. This study offers empirical evidence for understanding the disparity in sports participation and its health effects among urban and rural adolescents.

**Key Words:** Adolescents, Sports Participation, Physical and Mental Health, Empirical Analysis

Abstract ID: SM033

### **Normative Reference Values and Predicting Factors of Sport-Related Concussion for Contact and Non-Contact Games among Sport Schools Athletes in Malaysia**

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Sport-related concussion (SRC) is considered mild brain trauma following the incidence of direct or indirect hit on the head. Although the signs and symptoms are sound, the frequency of reporting among athletes is still lacking. The study aimed to provide a normative reference of SRC values among school-athletes in Malaysia. This study was carried out among school-athletes aged between 13 to 17 years old involving sport school nationwide. A validated questionnaire was used to assess the knowledge and attitude of 396 respondents who provided their written consent. Descriptive data were used to analyze the normative reference values for SRC which presented via means and standard deviation stratified by contact and non-contact games. The predictors of SRC were determined using a general linear model (GLM). Mean score ranged from  $13.75 \pm 3.2$  for SRC knowledge and  $54.23 \pm 7.27$  for SRC attitude. The t-test indicated there was no significant difference between contact and non-contact games athletes ( $p < 0.05$ ). The GLM shows that sport category is a predictor to attitude towards SRC among non-contact sports athletes. Meanwhile no predictors are found for knowledge and attitude toward SRC for contact sports athletes. The normative values provided herein can serve as a guide for interpreting SRC measurements obtained from school-athletes, especially from sport school in Malaysia. Many parties can benefit from the findings especially clinician, coaches, athletes and rehabilitation teams. Furthermore, during educational awareness, the sport therapists and researchers could use the

normal score ranges to document the progress of SRC and provide feedback to the athletes.

**Key Words:** knowledge, attitude, concussion, school, athletes

Abstract ID: SM056

### **The Effects of Balance Training with Stroboscopic Eyewear among Young Adults**

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Traditional balance training involves no intermediate level between eye-opened and eye-closed training. Stroboscopic eyewear provides an additional training level between eye-opened and eye-closed levels. This study compared the effects of balance training with and without stroboscopic eyewear among young adults. Twenty-nine healthy young adults (12 males, 17 females; mean age  $23.03 \pm 2.20$  years) were randomly assigned to the stroboscopic group ( $n = 9$ ), training group ( $n = 10$ ), and control group ( $n = 10$ ). The stroboscopic group underwent eight weeks of balance training with stroboscopic eyewear, while the training group did the same training without eyewear. The following six static balance tests were evaluated before and after the intervention using the Balance System™ SD: (1) double leg stance with eyes open; (2) double leg stance with eyes closed; (3) right side single leg stance with eyes open; (4) left side single leg stance with eyes open; (5) right side single leg stance with eye closed; (6) left side single leg stance with eye closed. Participants performed each test three times, and the overall stability index was collected. Data were analyzed using the Wilcoxon signed-rank test with a significant level of 0.05. The stroboscopic group showed significant improvement in double-leg stance with eyes open (overall stability index pre- vs. post-test median = 1.9 vs. 1.1), single-leg stance with eyes open (2.0 vs. 1.1), and single-leg stance with eyes closed (3.3 vs. 2.4). The training group improved significantly in double-leg stance with eyes open (1.2 vs. 0.6) and single-leg stance with eyes closed (3.3 vs. 2.7). Interestingly, right-side single-leg stances with eyes open (1.4 vs. 1.1) improved in the control group. Balance training with stroboscopic eyewear may be effective for enhancing static balance. Future studies with larger sample sizes are needed, especially focusing on participants with balance deficits.

**Key Words:** balance, stroboscopic vision, rehabilitation, sports injury

Abstract ID: SM060

### **The relationship between training load and injury in Japanese college American football players**

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The purpose of this study was to investigate the relationship between training load and injury in ground-based training and

strength training among Japanese collegiate American football players. The subjects were 20 players (9 linemen and 11 backs) from the University of Tsukuba's American football team, which competes in Division 2 of the Kanto Collegiate American Football League. The training load of ground-based training and strength training of 1 season (247 days) were collected. Ground-based training consisted of American football specific skills, tactical, speed and agility. Strength training consisted of traditional free-weight training sessions and Olympic weightlifting sessions. The training load in ground-based training was measured using session-RPE (Rate of perceived exertion) = Duration of training (min) × RPE (0~10). The training load in strength training was measured using total volume load = sets × repetitions × load (kg) and also session-RPE. Injury defined as time-loss injury that prevents participation in one or more practices or games. Acute load and chronic load were calculated using rolling average based on 7-day and 21-day periods, respectively, and ACWR was calculated by dividing Acute load by Chronic load. Logistic regression analysis was used to determine the relationship between training load and the occurrence of injury. In addition, each load indicator was classified using Z-scores, and the association between its categories was analyzed using odds ratios. Data were collected for 247 days and analyzed for 207 days; 78 injuries were recorded, with an incidence rate of 26.2 injuries per 1,000 AEs (95% CI: 16.3-36.1) during games and practices. In terms of body part, the three most common parts were the wrist and fingers (19%), head and neck (16%), and thigh (14%). Association between ACWR of ground-based training session-RPE (GRRPE ACWR) and the occurrence of injury was not significant, but injury risk of GRRPE ACWR "High" (>1.15) was 3.63 times higher than "Low" (<0.85) and 2.19 times higher than "Moderate" (0.85~1.15) ( $p < 0.05$ ). An association between ACWR of strength training total volume load (STVL ACWR) and the occurrence of injury was significant ( $p < 0.05$ ). Furthermore, the injury risk of STVL ACWR "Moderate High" (0.98~1.38) was 0.18 times that of "Very Low" (<0.2) and 0.35 times that of "Low" (0.2~0.59) ( $p < 0.05$ ). Association between ACWR of strength training session-RPE (STRPE ACWR) was also not significant. For 7 days acute load and 21 days chronic load, STVL 7, STVL 21, STRPE 7, and STRPE 21 were not significantly associated with the incidence of injury, while GRRPE 7 and GRRPE 21 were significantly associated with the incidence of injury ( $p < 0.01$ ). STVL ACWR in the "Moderate High" range (0.98~1.38) and GRRPE ACWR below 1.15 indicate a low incidence of injury. These results suggest the importance of combining two load factors in monitoring training load in American football.

**Key Words:** ACWR, training load, injury, American football, strength training

Abstract ID: SM065

### Correlation Between Isokinetic Muscle Strength of Vastus Medial Oblique and Q Angle in Healthy Males

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A larger Q angle and weaker vastus medial oblique are both risk factors for developing patellofemoral pain syndrome. Therefore, this experiment aims to determine the correlation between the Q angle and the strength of the vastus medial oblique in males. This study recruited 10 healthy male subjects (height:  $176.8 \pm 5.3$  cm, weight:  $78.3 \pm 14.2$  kg, age:  $24.2 \pm 1.2$  years). The Q angle was measured in a supine position using a goniometer, defined as the angle between the line connecting the anterior superior iliac spine to the center of the patella and the line connecting the tibial tuberosity to the center of the patella. The strength of the vastus medial oblique was assessed using a BIODEX isokinetic dynamometer, measuring the torque at the last 30 degrees of knee extension. The angular velocity of the isokinetic dynamometer was set at  $60^\circ/s$  and  $120^\circ/s$ , with each velocity repeated 5 times. Spearman's rank correlation was used to analyze the relationship between the Q angle and muscle strength. The mean Q angle was  $13.37 \pm 2.98$  degrees. At angular velocity of  $60^\circ/s$ , the mean peak torque of the vastus medial oblique was  $67.60 \pm 21.85$  N·m, and its ICC value with Q angle was  $-0.711$  ( $p = .021$ ). The mean average torque was  $60.86 \pm 20.65$  N·m, and its ICC value with Q angle was  $-0.632$  ( $p = .050$ ). The mean peak torque/BW (%) was  $85.01 \pm 17.64$  %, and its ICC value with Q angle was  $-0.681$  ( $p = .030$ ). At angular velocity of  $120^\circ/s$ , the mean peak torque was  $60.22 \pm 21.26$  N·m, and its ICC value with Q angle was  $-0.304$  ( $p = .393$ ). The mean average torque was  $52.89 \pm 19.51$  N·m, and its ICC value with Q angle was  $-0.334$  ( $p = .345$ ). The mean peak torque/BW (%) was  $76.08 \pm 22.49$  %, and its ICC value with Q angle was  $-0.328$  ( $p = .354$ ). This study found that in healthy males, the Q angle is negatively correlated with the isokinetic strength of the vastus medial oblique at angular velocity of  $60^\circ/s$ . The results of this study can be applied to exercise training for patellofemoral pain syndrome.

**Key Words:** Autonomic function, diurnal timing, exercise, high-intensity interval training

Abstract ID: SM129

### A study on the effect of exercise intervention on blood factor FPG in myasthenia gravis population

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Sarcopenia is a progressive and generalised skeletal myopathy due to loss of muscle mass and strength in the elderly population. And exercise intervention, as one of the non-pharmacological therapies, is considered to be an important tool for the prevention and treatment of sarcopenia. Exercise not only increases muscle mass and strength, but also improves physical function and quality of life. The aim of this paper is to explore the study of the effect of exercise intervention on blood factor FPG in myasthenia gravis population, which in turn can help to improve muscle condition and physical function in myasthenia gravis population. In this study, the effect of exercise intervention on blood factor FPG in myasthenia gravis population was studied by using literature method, mathematical statistics and experimental method. Exercise intervention was carried out for a period of 3 months in 59 people with sarcopenia aged 65-75 years. Dietary



intervention and health promotion were conducted in both experimental and control groups, while the experimental group underwent exercise intervention for 3 months, 3 times a week. The data before and after the experiment were analysed using SPSS 27.0 statistical software. Results: (1) After the 3-month experiment, the FPG levels of both groups showed a decreasing trend, but with significant differences ( $p < 0.05$ ); (2) there was a significant positive correlation between the FPG levels of the experimental group and the SMI after the intervention ( $p < 0.01$ ); between the FPG and the SMI of the control group, there was no correlation ( $p > 0.05$ ). Conclusion: (1) Regular aerobic and resistance training improves insulin sensitivity, reduces FPG levels, prevents and controls type 2 diabetes thus better preventing sarcopenia. (2) Exercise intervention has a significant effect on improving muscle mass and muscle strength in older adults. It also plays an important role in improving metabolic health and preventing related chronic diseases in older adults.

**Key Words:** sarcopenia, exercise intervention, FPG

## EXERCISE SCIENCE

Abstract ID: YIA-ES073

### The Impact of Physical Exercise on Depression in Middle-aged and Elderly Hypertensive Individuals: An Analysis from the China Health and Retirement Longitudinal Study

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This study aims to explore the impact of physical exercise on depression symptoms in middle-aged and elderly hypertensive individuals in China, with the goal of improving the efficiency of depression prevention and treatment and reducing its incidence. Using cross-sectional data from the China Health and Retirement Longitudinal Study (CHARLS) in 2020, this study analyzed 5,877 middle-aged and elderly hypertensive patients ( $64.87 \pm 9.09$ ). A multivariate logistic regression model was constructed, taking into account demographic characteristics, lifestyle habits, and health status, to analyze the impact of physical exercise on depression symptoms in middle-aged and elderly hypertensive patients and potential factors influencing the onset of depression symptoms. Among the 5,877 hypertensive patients, 2,605 (44.3%) had depression symptoms, with 52.4% being female and 49.4% residing in rural areas. Multivariate logistic regression analysis showed that gender (female: OR=1.998, 95%CI [1.791, 2.229]), residence (rural: OR=1.697, 95%CI [1.518, 1.898]), age  $\geq 60$  (OR=1.169, 95%CI [1.034, 1.321]), education level (below elementary school: OR=2.233, 95%CI [1.829, 2.726]), retirement status (no: OR=1.728, 95%CI [1.479, 2.018]), were risk factors for depression in middle-aged and elderly hypertensive patients. Various types of physical pain also increased the likelihood of depression, including headaches (OR=1.804, 95%CI [1.568, 2.075]); stomach pain (OR=1.380, 95%CI [1.164, 1.635]); leg pain (OR=1.663, 95%CI [1.441, 1.918]); knee pain (OR=1.231, 95%CI [1.065, 1.423]); and back pain (OR=1.237, 95%CI [1.081, 1.415]). Sleep duration <

6h (6~7.9h: OR=0.659, 95%CI [0.485, 0.897]); 8~9.9h: OR=0.566, 95%CI [0.410, 0.782]) were protective factors for depression in middle-aged and elderly hypertensive patients. Compared to high-intensity physical exercise, moderate- and low-intensity physical exercise had better effects on preventing and treating depression symptoms in middle-aged and elderly hypertensive patients (moderate: OR=0.862, 95%CI [0.782-0.950]; low: OR=0.786, 95%CI [0.692-0.893]), showing a significant negative correlation with depression symptoms in this population. Depression symptoms are more pronounced among middle-aged and elderly hypertensive patients who are female, live in rural areas, are aged  $\geq 60$ , Sleep duration  $\geq 6$ h, education level below elementary school, not retire and experience physical pain. Appropriate intensity of physical exercise has potential benefits in preventing and treating depression in middle-aged and elderly hypertensive patients.

**Key Words:** Physical activity, Depression, Hypertension, Depression

Abstract ID: YIA-ES085

### A Study on the Construction of Winning Technique Models for Elite Men's Basketball Teams: A Case Study of the Semifinalists in the 2023 FIBA Men's World Cup

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The top four teams in the FIBA Basketball World Cup represent the pinnacle of global basketball. In competitive sports, the level of performance is often considered the key to victory. However, athletic performance is a multifaceted concept encompassing "physical, technical, mental, and strategic" elements, making it challenging to quantify and assess. Despite this complexity, technical metrics in basketball games reflect the overall competitive level of players or teams and integrate various performance factors. This study aims to identify the key factors influencing match outcomes (win/loss) through the analysis of technical metrics, referred to as "winning techniques." Additionally, it seeks to predict match results to some extent using winning technique models, providing an objective analysis of competitive performance. The findings will offer quantitative data and valuable decision-making references for improving the performance level of men's basketball. Based on fundamental measurement theory, this study employs multivariate statistical methods—including correlation analysis, factor analysis, and binary logistic regression analysis—to conduct a systematic and quantitative investigation of the winning techniques of the top four teams in the 2023 FIBA Men's Basketball World Cup from two dimensions (micro and meso). Additionally, a regression model is developed to support the analysis. First, the statistical analysis of technical indicators between the winning and losing groups indicates that the winning group had significantly higher values in X1 (points scored), X2 (field goal percentage), X7 (defensive rebounds), X8 (total rebounds), and X9 (assists) compared to the losing group ( $P < 0.05$ ), while X10 (fouls committed) was significantly lower ( $P < 0.05$ ). Other indicators showed no significant differences ( $P > 0.05$ ). Second, the micro-level winning techniques model is represented by the equation:

$\ln[p/(1-p)]_{\text{micro}} = 0.071S1$  (efficiency value) +  $0.261S2$  (defensive rebounds) - 13.211. In this model, the S1 efficiency value ( $B = 0.071$ ,  $OR = 1.073$ ,  $P < 0.01$ ) and S2 defensive rebounds ( $B = 0.261$ ,  $OR = 1.300$ ,  $P < 0.05$ ) are both positive predictors of victory. Third, the meso-level winning techniques model is expressed by the equation:  $\ln[p/(1-p)]_{\text{meso}} = 1.863Z1$  (offensive factor) +  $1.000Z2$  (defensive factor) -  $1.162Z3$  (fouling factor) + 0.306. Here, the Z1 offensive factor score ( $B = 1.863$ ,  $OR = 6.433$ ,  $P < 0.01$ ) and Z2 defensive factor score ( $B = 1.000$ ,  $OR = 2.719$ ,  $P < 0.05$ ) are positive predictors of victory, while the Z3 fouling factor score ( $B = -1.162$ ,  $OR = 0.313$ ,  $P < 0.05$ ) is a negative predictor.

**Key Words:** Basketball winning techniques, Winning model, Regression analysis, FIBA Basketball World Cup

Abstract ID: YIA-ES096

### Measured Resting Metabolic Rate and the Evaluation of Nutrition Intake of Regular Climbers in Klang Valley, Malaysia

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Despite increasing popularity in sport climbing, there are limited studies on nutritional needs of climbers. This study aimed to determine the resting metabolic rate (RMR) of regular climbers and compare their nutrition intake to their requirements. A cross-sectional study was conducted among regular climbers from an indoor climbing gym (BUMP Bouldering, Jaya One) in Klang Valley, Malaysia. Data on sociodemographic, climbing experience, and medical history of climbers were collected. RMR was derived from Weir's equation using the readings of oxygen consumption and carbon dioxide production of the climbers while they were wearing a portable indirect calorimetry. Data recorded with respiratory exchange ratio (RER)  $>0.86$  were deemed invalid and excluded from analysis. Dietary intake was obtained with a 7-day diet history interview and further analyzed to compare their nutritional requirements. In total, 49 climbers (32 (65.3%) males, 17 (34.7%) females (aged  $27.5 \pm 4.5$  years)) participated in the study. The RMR of male and female climbers were  $1928 \pm 264$  and  $1509 \pm 272$  kcal/day, respectively ( $p < 0.001$ ). For dietary intake, the climbers reported energy, carbohydrates, protein, and fat intake of 1552 (568) kcal/day, 167.9 (63.1) g/day, 68.3 (21.5) g/day, and 71.9 (31.9) g/day, respectively. Majority of the climbers (64.9%) had energy intake below their RMR. Only about one-third of climbers had carbohydrates and protein intake achieving the recommendation of the American College of Sports Medicine (ACSM), while the majority (79.6%) had fat intake exceeding ACSM recommendation. In conclusion, male climbers had a higher RMR than female climbers. The majority of the climbers reported energy, carbohydrates, and protein intake below their requirements, and excessive fat intake. This highlights the need for nutritional intervention to optimize the physical health and sport performance of this population.

**Key Words:** Climbing, Resting metabolic rate, Nutrition, Diet

Abstract ID: YIA-ES132

### Association Between Body Composition and Fitness Performance Among Malaysian Military Cadets

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This study aimed to examine the relationship between body composition and fitness performance among Malaysian military cadets. A cross-sectional study was carried out on 270 Malaysian military cadets, with 244 (90%) completing the physical tests. Measurements included height, weight, body mass index (BMI), body fat percentage, muscle mass, muscle percentage, basal metabolic rate (BMR), water weight, water percentage, sit-up count, push-up count, and predicted VO<sub>2</sub>max (2.4 km run test). Descriptive statistics and correlation analysis were conducted to examine the relationships between body composition and fitness performance. Descriptive statistics showed that males had an average height of 169.6 cm, weight of 64.8 kg, and BMI of 22.5 kg/m<sup>2</sup>, while females had an average height of 160.2 cm, weight of 54.3 kg, and BMI of 21.2 kg/m<sup>2</sup>. Fitness tests showed males averaging 43 sit-ups, 45 push-ups, and a VO<sub>2</sub>max of 50.0 ml/kg/min, while females averaged 42 sit-ups, 21 push-ups, and a VO<sub>2</sub>max of 43.1 ml/kg/min. Correlation analysis found a low-to-moderate relationship ( $p < 0.01$ ) between body composition and physical performance. Negative correlations were found between BMI, body fat percentage, and performance in push-ups ( $r = -0.25$  to  $-0.30$ ) and VO<sub>2</sub>max ( $r = -0.39$  to  $-0.42$ ), while muscle mass and muscle percentage showed positive correlations with fitness performance ( $r = 0.25$  to  $0.40$ ). The study emphasizes the significance of optimal body composition for improved physical performance. Military cadets should have a lower BMI and body fat percentage, as well as more muscle mass and muscle percentage, to perform optimally.

**Key Words:** Body Composition, Physical Fitness, Predicted VO<sub>2</sub>max, Fitness Profiling, Military Cadets

Abstract ID: YIA-ES149

### Effects of Tiger Balm Active Muscle Rub on Endurance Performance and Other Physiological Measures

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To investigate the effects of applying Tiger Balm Active Muscle Rub before endurance exercise and other physiological measures. A total of 12 healthy male adults (age:  $24.08 \pm 0.94$  yrs, height:  $176.69 \pm 8.51$  cm; weight:  $71.16 \pm 8.51$  kg; fat free mass (FFM):  $60292.17 \pm 6347.27$  g; body fat %:  $15.91 \pm 7.20$  %; body mass index (BMI):  $22.93 \pm 2.30$  kg·m<sup>-2</sup>) participated in a randomised single-blinded experimental study design. Participants underwent 3 rounds of testing under different

conditions (control (CON), tiger balm active muscle rub (TBAMR) and placebo (PLA)) on a cycle ergometer till volitional exhaustion. Before each test, participants either applied PLA cream or TBAMR on both of their lower limbs. The cycling workload increased 1kg every 3 minutes and they cycled at 50 revolutions per minute (RPM) minimally. Time-to-exhaustion (TTE) was recorded; heart rate (HR), rate of perceived exertion (RPE), blood lactate (BLa) was measured at the end of every stage. Repeated ANOVA measure results revealed no significant differences between all 3 conditions for TTE  $F(2, 22) = 2.668, p = 0.092$ ); work done  $F(2, 22) = 2.706, p = 0.089$ ); maximum RPE (RPEmax)  $F(2, 22) = 1.375, p = 0.274$ ); maximum HR (HRmax)  $F(2, 22) = 0.988, p = 0.388$ ); maximum BLa (BLamax)  $F(2, 22) = 2.862, p = 0.079$ ). However, paired-t test results indicated significant difference between CON BLamax and TBAMR BLamax (CON BLamax:  $5.43 \pm 1.10$  mmol·L<sup>-1</sup> vs. TBAMR BLamax:  $6.33 \pm 1.05$  mmol·L<sup>-1</sup>,  $p = 0.036$ ). TBAMR may not significantly improve maximal aerobic exercise performance. However, the significantly higher lactate load for TBAMR could be due to the warmth generated by the cream thus leading to an increase in blood flow which further led to the recruitment of more muscle fibres. Therefore, this generated higher lactate loads with no improvement in timings. Nevertheless, this study could be further investigated on the track that may induce a faster 400m timing.

**Key Words:** maximal aerobic test, cycle ergometer, time-to-exhaustion, exercise cream

Abstract ID: YIA-ES150

### Comparison of scapular function, rotator cuff muscle strength, and structural shoulder stability between with and without subjective shoulder instability in baseball players

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Subjective shoulder instability in baseball players impacts performance and requires effective assessment. The instability is speculated to be caused by scapular dysfunction, rotator cuff muscle weakness, and structural shoulder instability. This study aimed to compare these factors with and without subjective instability and to explore the association. Twenty-one college baseball players are divided into the stability group (0 points,  $n=11$ ) and instability group (1-48 points,  $n=10$ ) by the Oxford Shoulder Instability Score, a subjective instability assessment sheet. Scapular dysfunction was tested by the Scapular Dyskinesia Test and separated to negative or positive results. Rotator cuff muscle strength was measured in the second position. Structural instability was assessed by ultrasound images to measure anterior and posterior humeral head displacement. Chi-square tests examined the association between subjective instability and Scapular Dyskinesia Test. Unpaired t-tests compared structural instability and rotator cuff muscle strength between the groups. The positive result of the Scapular Dyskinesia Test showed a significantly higher rate in the instability group (70.0% vs. 27.3%;  $p<0.05$ ). The instability group exhibited greater posterior instability than the stability

group ( $1.16 \pm 0.34$  mm vs.  $0.70 \pm 0.33$  mm;  $p<0.05$ ). No significant differences in muscle strength between the groups. In the throwing motion, the mechanical stress from ball release to follow-through occurs in the direction of the humeral head sliding posterior. As this time shoulder stability is maintained by the dynamic scapular stability and stability of the posterior tissues in glenohumeral joints. This study indicated that objectively the scapular dysfunction and posterior structural instability disrupted the mechanism for resisting the mechanical stress in the specific phase of throwing motion and caused subjective instability.

**Key Words:** subjective shoulder instability, scapular dysfunction, rotator cuff muscle strength, baseball players, Scapular Dyskinesia Test

Abstract ID: YIA-ES172

### Contribution of Stretch-shortening Cycle Qualities to Badminton Change of Direction in Elite Badminton Players

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The determinant of change of direction (COD) performance has been claimed to be context-specific, considering the sports, level of play and gender. The purpose of this study was to investigate the factors contributing to badminton COD in the elite players from the perspective of stretch-shortening cycle (SSC) qualities (fast, slow, or without SSC). A total of 30 elite players (Male:  $n=16$  Age= $20.6 \pm 1.0$ , Weight= $71.08 \pm 4.29$ kg, Height= $1.75 \pm 0.04$ m; Female:  $n=14$ ; Age= $20 \pm 2.3$ , Weight= $60.34 \pm 4.24$ , Height= $1.61 \pm 0.05$ m) were assessed with countermovement jump (CMJ), 10-5 repeated jump (10-5 RJ) and squat jump (SJ) using contact mat, followed by a badminton specific COD test using timing gate. Pearson correlation analysis and multiple regression analysis were conducted on all the variables with genders separated. Between-group comparisons based on COD performance (fast versus slow) was also computed. CMJ ( $49.2 \pm 4.5$ cm) and SJ ( $43.6 \pm 3.7$ cm) performance were significantly associated with COD ( $7.93 \pm 0.25$ s) in male ( $r=0.79$  and  $0.74$ , respectively,  $p<0.01$ ), while CMJ ( $34.5 \pm 2.6$ cm) and 10-5 RJ performance ( $1.95 \pm 0.3$ m/s) were significantly associated with COD ( $8.59 \pm 0.34$ s) in female ( $r=0.68$  and  $0.55$ , respectively,  $p<0.05$ ). Additionally, through stepwise regression model analysis CMJ performance was identified as the only predictor of COD performance, explaining 62.3% and 45.7% of variance for male and female, respectively. The faster group also demonstrated significantly better CMJ performance compared to the slower group ( $p<0.05$ ) in both genders (mean difference: 5.6cm for male and 3.6cm for female). Our findings suggested the determinants of badminton COD are different across genders. While the COD performance in male is attributed by slow SSC, female is attributed by both slow and fast SSC. Thus, coaches should consider on the training of SSC characteristics to promote a better transfer of training effect to the badminton COD performance.

**Key Words:** Badminton, Change of Direction, Elite, Stretch shortening Cycle

## SPORT MEDICINE & ATHLETIC TRAINING

Abstract ID: YIA-SM032

### Reproducibility of the Dynamic Balance Assessment in Males and Females: A Longitudinal Study

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Reproducible movement is crucial for athletes, and dynamic balance on landing is an important element of performance. There are fundamental biological differences between males and females that may lead to different difficulties in ensuring reproducibility of performance. However, no studies have investigated the day-to-day variation of dynamic balance considering sex differences. This study aimed to confirm the reproducibility of repeated dynamic balance measurements for each sex. This was a longitudinal study involving 48 feet from 12 males and 12 females. The participants were instructed to jump forward over a hurdle, land on the force plate with one foot, and hold their posture (AccuGait; AMTI Japan Ltd, Kanagawa, Japan). The dynamic balance was calculated by compositing the triaxial ground reaction forces. Measurements for males were obtained four times, approximately once a week, and for females, once during each of the four periods considering the menstrual cycle (menstrual, follicular, ovulation, and luteal phases). The intraclass correlation coefficient for dynamic balance was excellent for males at 0.93 (0.88–0.97) and good for females at 0.84 (0.71–0.96). The results of the dynamic balance of males showed no fluctuations ( $p = 0.778$ ). There are significant differences in the four measurements in females ( $p = 0.011$ ), and dynamic balance deteriorated most during the ovulation phase (menstrual:  $0.29 \pm 0.04$ ; follicular:  $0.28 \pm 0.04$ ; ovulation:  $0.32 \pm 0.04$ ; luteal:  $0.28 \pm 0.04$ ). While the reproducibility of dynamic balance was high overall, it was lower in females than males. Females showed fluctuations in these measurements during each period of the menstrual cycle, and fluctuations of hormonal balance and body composition may have made it difficult to control female postural sway. This study could be useful in establishing reproducible performance and injury prevention strategies with consideration for sex.

**Key Words:** reproducibility, sex difference, balance ability, static balance, dynamic balance

Abstract ID: YIA-SM034

### Effects of Full Marathon Run on the Stiffness of Plantar Fascia and Iliotibial Band measured by ultrasound Shear Wave Elastography

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This study aims to test our hypothesis that a full marathon run would decrease stiffness in the plantar fascia and the iliotibial

band due to the mechanical fatigue induced by the accumulated stress placed on these tissues. Four male healthy university students participated in a full marathon run. Before and one-day following running, shear wave velocity (an index of stiffness) of plantar fascia and iliotibial band on both sides was measured using B-mode ultrasonography and ultrasound shear wave elastography. The shear wave velocity measurements of plantar fascia were obtained at two locations: the proximal region at the medial calcaneal tubercle and middle region at the navicular, and the measurements of the iliotibial band were obtained at the proximal, midpoint, and distal regions. The shear wave velocity values of the plantar fascia and the iliotibial band were averaged from three measurements using Q-Box Trace software. Shear wave velocity of the plantar fascia and iliotibial band were not significantly different before and a day following full marathon running. A decreased shear wave velocity was observed in both right and left distal plantar fascia after running, although no significant difference was found ( $p=0.125$ ). On the other hand, the iliotibial band exhibited slight variations in stiffness across the distal, middle, and proximal regions after running, but these variations were also not significant ( $p = 0.125$ ). The coefficient of variation of each parameter's measurement was <5%, indicating good measurement reliability. The findings suggest that a single full marathon run would not significantly impact the plantar fascia and iliotibial band stiffness on the following day.

**Key Words:** plantar fascia, iliotibial band, marathon running, shear wave elastography, ultrasonography

Abstract ID: YIA-SM066

### The efficacy of BCAAs supplementation on the rate of force development in different time intervals: a randomized, crossover, double-blind, placebo-controlled study

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Branched Chain Amino Acids (BCAAs) have been widely used as a sports nutrition supplement, and recent studies have explored their effects in pre-workout supplement. However, to date, no study has validated their effects on rate of force development (RFD). The aim of this study was to investigate the effects of supplementation with BCAAs on the RFD of college basketball players during simulated games. Sixteen elite basketball players were selected as subjects (mean age:  $21.5 \pm 1.5$  years; mean height:  $185.8 \pm 5.5$  cm; mean weight:  $85.8 \pm 10.8$  kg), all of whom were national-level athletes and reported robust health status following the model of a randomized, crossover, double-blind, placebo-controlled study with 1-week washout period. Participants were orally administered BCAAs (0.17 g/kg combined with 0.17 g/kg isocaloric glucose) or placebo (0.34 g/kg isocaloric glucose) 40 minutes prior to the start of the exercise, and RFD values were quantified utilizing the IMTP (isometric midthigh pull) test, which employed a dual-force platform system, subjects underwent multiple IMTP tests pre-, mid-, and post-exercise protocol, with software accurately capturing and documenting RFD metrics in different time intervals. A two-way repeated-measures ANOVA was employed



to ascertain the effects of the within-subject factors, supplementation, and time for variables. Under both supplementation strategies, the overall trend in each RFD decreased as the test progressed; within the 50-ms interval, significant differences between the placebo and BCAAs groups were manifest prior to the exercise protocol ( $3632.7 \pm 1039.9$  N/S(BCAAs) vs.  $2793.9 \pm 1154.0$  N/S(PLA),  $p=0.045$ ), concurrent with ( $4099.6 \pm 1486.1$  N/S(BCAAs) vs.  $2468.6 \pm 1045.6$  N/S(PLA),  $p=0.002$ ), and subsequent to the exercise protocol ( $3112.0 \pm 1221.0$  N/S(BCAAs) vs.  $831.9$  N/S(PLA),  $p=0.002$ ), and this difference did not change as the exercise protocol progressed. However, in other time intervals there was no statistical difference, although the BCAAs group still had slightly elevated values compared to the placebo group. The acute pre-workout ingestion of BCAAs was found to enhance the 50ms RFD during the exercise protocol. In a practical context, this study demonstrated that BCAAs have a positive effect on specific technical movements within basketball that demand rapid force generation within the initial 50ms, encompassing movements such as drives, changes of direction, and jumps. Moreover, our findings add to the robust evidence supporting BCAAs' efficacy when used as a pre-exercise supplement.

**Key Words:** BCAA, rate of force development, isometric midhigh pull, fatigue

Abstract ID: YIA-SM067

### The Relationship between Sarcopenia, Physical Activity, and Cognitive Function among Community-Dwelling Older Adults in Malaysia

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A physically active lifestyle significantly improves the quality of life, which is associated with better physical fitness and cognitive functioning in older adults. This study aims to determine the relationship between sarcopenia, cognitive functions, and physical activity among community-dwelling older adults in Malaysia. Community-dwelling older adults in high-density towns in Malaysia were assessed for sarcopenia using the Asian Working Group for Sarcopenia 2 (AWGS2) criteria. Cognitive assessments were conducted for Montreal Cognitive Assessment (MoCA), Trail Making Test, and Digit Symbol Substitution Test. Physical activity (PA) levels and nutritional status were assessed using the Physical Activity Scale for Elderly (PASE) and Mini Nutritional Assessment (MNA), respectively. Statistical analyses using Pearson's correlation, Chi-squared test and multiple linear regression were conducted to assess the associations between physical activity level, cognitive functions while controlling for nutritional status on sarcopenia conditions. Among a total of 677 community-dwelling older adults the mean age of women participants was  $67.8 \pm 5.8$  years, while the mean age of men participants was  $68.7 \pm 6.3$  years. The prevalence of sarcopenia among women was found to be higher, with 5.8% having sarcopenia as compared with men was 0.4%. However, both genders have the same prevalence of severe sarcopenia with 2.7%. There is a statistically significant association between sarcopenia levels and cognitive function

levels,  $\chi^2(3, N=347) = 8.03$ ,  $p = 0.045$ . Physical activity level does not show any significant relationship when analyzed separately with sarcopenia levels and cognitive functions. In the multiple regression model, the prevalence of sarcopenia, along with age, education, physical activity, nutritional status, and number of chronic diseases, significantly predicted cognitive function ( $R^2 = 0.31$ ,  $F(15, 221) = 6.68$ ,  $p < 0.001$ ). This study highlighted the importance of considering sarcopenia and related factors in efforts to preserve cognitive health in community dwelling older adults. Additionally, the findings inform targeted interventions aimed at preventing cognitive decline by addressing modifiable risk factors such as physical activity and nutritional status.

**Key Words:** community-dwelling older adults, sarcopenia, cognitive function, physical activity

Abstract ID: YIA-SM110

### Blood Flow Restriction Combined with Calf Eccentric Training Induces Post-activation Potentiation and Improves Jump Performance

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This study investigates the impact of calf eccentric training with blood flow restriction on post-activation potentiation, exploring the immediate effectiveness of this training method in improving jump performance. Twenty-four male college students with experience in strength training were recruited in this cross-over, randomised study. Before the intervention, Optojump was used to collect drop jump data as the baseline. After that, all participants proceeded to the intervention. Each participant carried out two experimental treatments, calf eccentric training (4 sets of 30-15-15-15) either with or without blood flow restriction (occlusion set at 70% of arterial occlusion pressure), in a random sequence. Drop jump tests were conducted at 4, 8, 12 and 16 minutes post-training. There was a washout period of at least 72 hours between the two interventions. A two-way repeated measure was used to compare the effects on drop jump performance at different post-training time intervals and to assess the interaction between the intervention methods and post-training time intervals. When comparing jump performance indicators between post-training time intervals and different intervention methods, a significant interaction effect was found for contact time ( $p=0.035$ ) and jump height ( $p=0.028$ ). Blood flow restriction combined with calf eccentric training can improve jump performance, particularly reflected in the increase in jump height ( $p=0.005$ ) and contact time ( $p=0.007$ ) 12 minutes post-training. Calf eccentric training without blood flow restriction fails to induce post-activation potentiation, there were no significant differences in jump performance across the different post-training times. The most effective time for the post-activation potentiation with blood flow restriction combined with calf eccentric training is approximately 12 minutes. Blood flow restriction can facilitate the induction of post-activation potentiation in exercise training more easily.

**Key Words:** post activation potentiation, blood flow restriction, calf eccentric training, drop jump

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## Challenges and Innovations in Hypoxia Training Research: A Multidimensional Analysis

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Hypoxia training has emerged as a pivotal strategy to augment athletic performance and acclimate to high-altitude conditions. However, the adoption and effectiveness of hypoxia training are impeded by various challenges. This study aims to delineate the primary issues within the realm of hypoxia training research and propose innovative solutions. Our research objective is to scrutinize the existing body of literature and case studies to identify the current focus on high-level and elite athletes, while highlighting the dearth of research concerning adolescents, amateur athletes, and sub-healthy populations. Utilizing a comprehensive literature review and case study analysis, we have uncovered an imbalance in the distribution of research efforts, with a predominant emphasis on elite athletes. This approach has overshadowed the need for studies that encompass a broader demographic, including younger, less experienced, and sub-healthy populations. Furthermore, our findings indicate a paucity of research on the long-term effects of hypoxia training, leaving a knowledge gap regarding the potential adverse impacts on the body. In response to these findings, we advocate for a more equitable distribution of research focus, ensuring that both physical ability-dominated and skill-dominated sports receive equal consideration. We propose expanding the scope of research subjects to include a wider range of athletes, thereby providing a more inclusive understanding of hypoxia training's applicability and efficacy. We conclude by emphasizing the necessity for a systematic theoretical framework and practical guidelines for high-altitude training. Encouraging interdisciplinary research will integrate diverse findings, leading to evidence-based training plans that enhance the high-altitude training industry's quality and effectiveness.

Key Words: Hypoxia Training, Hypoxia Training, Interdisciplinary Approach

## Relationship Between the Medial Elbow Joint Space Gapping During Ball Grasping and the Cross-Sectional Area of Flexor Digitorum Superficialis and Flexor Carpi Ulnaris: an ultrasound-based study

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In baseball players, valgus stress is applied during the pitching motion and is greatest during the late cocking phase. Previously, anatomical studies reported that flexor digitorum superficialis and flexor carpi ulnaris are important dynamic stabilizing mechanisms for elbow valgus stability, however no studies have assessed them in position during late cocking phase. In this

study, we used ultrasound imaging to investigate the contribution of flexor digitorum superficialis and flexor carpi ulnaris as elbow valgus stabilizers during late cocking phase. Fourteen healthy male collegiate baseball players participated in this study. The throwing side was valued. The medial elbow joint space gapping and the cross-sectional area of flexor digitorum superficialis and flexor carpi ulnaris were assessed using ultrasound (KONICA MINOLTA, Japan). The gapping was measured at a second position similar to the late cocking phase. Pearson's correlation coefficient was applied to confirm the relationship between the medial elbow joint space gapping and the cross-sectional area of flexor digitorum superficialis and flexor carpi ulnaris on the throwing side. The significance level was set at  $p < 0.05$ . A significant positive correlation showed between the medial elbow joint space gapping and the cross-sectional area of flexor digitorum superficialis ( $r=0.75, p<0.01$ ). In baseball players, the ball is strongly grasped by resisting efferent force during the late cocking phase. In this situation, only the muscle strength of the flexor digitorum superficialis is increased in the previous study. The flexor digitorum superficialis may be a more important muscle than flexor carpi ulnaris as an elbow valgus stabilizer during the pitching motion.

Key Words: Baseball, Medial elbow joint space, Elbow valgus stability, Ultrasound

## Functional Recovery In Stroke Patients Under Rehabilitation Treatment Intervention Is Affected By Glenohumeral Subluxation

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This study investigated the impact of glenohumeral subluxation on functional recovery in stroke patients, specifically focusing on limb function, activities of daily living (ADL), and balance. A prospective cohort study was conducted with 34 first-time stroke patients who were within six months of their stroke onset. The participants were divided into an observation group with glenohumeral subluxation ( $n = 17$ ) and a control group without subluxation ( $n = 17$ ). Both groups received four weeks of routine rehabilitation therapy. Functional assessments included the Modified Barthel Index (MBI), the Berg Balance Scale (BBS), and the Fugl-Meyer assessment (FMA) for upper and lower limb motor function. Pre-intervention analysis showed no significant differences between the two groups in terms of sex ratio, age ( $p = 0.148$ ), duration of illness ( $p = 0.519$ ), affected side ( $p = 0.732$ ), or type of stroke ( $p = 0.166$ ). Post-treatment, both groups demonstrated significant improvements in all functional measures ( $p < 0.001$ ). However, the control group exhibited better recovery in upper limb function as measured by the Fugl-Meyer Assessment (FMA) for the upper limb ( $p < 0.001$ ), lower limb function (FMA lower limb) ( $p < 0.001$ ), the MBI ( $p = 0.021$ ), and the BBS ( $p = 0.002$ ). Glenohumeral subluxation significantly hinders the recovery of upper limb function in stroke patients and adversely affects the improvement of lower limb function, balance ability, and activities of daily living.

**Key Words:** stroke, glenohumeral subluxation, Rehabilitation treatment, Functional recovery

## SPORT PEDAGOGY

Abstract ID: OP-PE024

### Effects of Strobe Image Feedback on Running Long Jump Performance in Physical Education Classes

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The purpose of this study was to determine the effect of strobe image feedback on running long jump performance in physical education classes. The participants were 52 male students aged 17–18 years. They were divided into the following two groups: a strobe image feedback learning (SL) group (n = 29), in which the participants set subsequent practice tasks after observing their own movements through strobe images, and a group learning (GL) group (n = 23), where three or four students observed a target participant's movements and set subsequent practice tasks based on their feedback. The jump distances were compared before and after the feedback. A two-way analysis of variance revealed that the main effect of group (SL vs. GL) was nonsignificant ( $P > 0.05$ , effect size [ES] = 0.08), whereas the main effect of time (pre- vs. post-test) was significant ( $P < 0.05$ , ES = 0.10). Treated data showed that the interaction was significant ( $P < 0.05$ , ES = 0.31). Post-hoc tests revealed a significant difference between pre- and post-test in the SL group (pre:  $4.08 \pm 0.47$  m, post:  $4.16 \pm 0.46$  m,  $P < 0.05$ , ES = 0.29). Therefore, the jump distance was significantly improved in the SL group attributing that after the feedback and accompanying practice, as the feedback made the group members more aware of the intrinsic force exerted by their lower and upper limbs in the main practice task. This suggests that strobe image feedback can provide effective and reasonable information for improving the effectiveness of running long jump performance.

**Key Words:** Feedback, Running long jump, Physical education class, Strobe image

Abstract ID: OP-PE087

### Examining the Challenges and Benefits of Bilingual Physical Education under Taiwan's "2030 Bilingual Policy": Insights from Teachers in Taoyuan and New Taipei City

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This study examined the effectiveness of bilingual physical education (PE) instruction in Taiwan under the "2030 Bilingual Policy." Semi-structured interviews were conducted with three PE teachers from Taoyuan and New Taipei City, chosen for their involvement in bilingual teaching. The aim was to gather insights

into their experiences regarding policy implementation, and to explore associated challenges and benefits. The results indicated that the policy significantly improved students' English listening and speaking skills, despite initial hesitancy in bilingual PE classes. Over time, students showed marked progress in understanding and responding to teachers' instructions. Teachers expressed concerns about the ambitious 2030 deadline, citing current progress and existing challenges. While bilingual PE resources are becoming more accessible, a shortage of standardized materials and inconsistent Mandarin-English ratios posed instructional challenges. Despite these obstacles, teachers reported enhanced cross-cultural communication skills and professional development. They also noted uncertainty arising from varied suggestions by observing professors. Overall, bilingual PE instruction provided students with increased learning opportunities, improved English proficiency, and fostered a dynamic learning environment. The study suggested that achieving the goals of the "2030 Bilingual Policy" hinges on collaborative efforts among government entities, schools, and teachers to address challenges and optimize policy effectiveness.

**Key Words:** Pedagogical challenges, Teacher perspectives, Student engagement

Abstract ID: OP-PE099

### A Research on Constructing Functional Strength Training in the University Physical Educational System under the Background of Educational Innovation

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In the era of curriculum reformation at universities around the world and educational innovation for talent cultivation, functions provided by physical education (PE) have always been the focus of university training and educating talents. The purpose of the study is to arouse students' interests and improve students' performance and thus attain the goal of reconstructing the PE system at universities by means of combining the functional strength training hidden in the fields of physical therapy and sports training nowadays with university PE education under the guidance of educational innovation. These studies make investigations in constructing the PE system by introducing this functional training through literature searching, scholar interviewing, questionnaire delivering, group discussion and sample experiments. The results indicate that functional strength training taught in the classroom can arouse students' interests in sports, enhance their positive participation and therefore improve their athletic performance. The introduction of functional strength training into university can meet the requirements of the educational innovation background of the times, and play a more multifaceted role in the innovation of education and training. In the future, university physical education should continue to develop around the themes of "innovation" and "inclusiveness". Also, the integration of functional strength training into university physical education is also in line with the diversified development of today's physical

education and promotes educational innovation in the tide of history.

**Key Words:** Functional Strength Training, University, physical education, System

Abstract ID: OP-PE108

### **An experimental study on multi-feedback teaching method in basketball teaching for children aged 8-10**

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In 2022, the Wuhan Municipal People's Government issued the Wuhan National Fitness Implementation Plan (2022-2025), which mentioned that it is necessary to deepen the integration of sports and education and help the city's young people master one or two lifelong fitness skills, and it also emphasized the need to comprehensively promote the establishment of basketball courses in the fourth grade of primary school. Childhood is undoubtedly an excellent time to learn and master sports skills, and learning basketball skills has profound practical significance. However, the commonly used teaching methods are often difficult to achieve the desired teaching effect, and it is also inadequate to stimulate students' enthusiasm and interest in basketball learning. Therefore, it is urgent to explore more reasonable and efficient teaching methods in order to effectively cope with the practical challenges and problems faced by conventional basketball teaching. The research mainly uses the methods of literature review, expert interview, questionnaire, experiment and mathematical statistics, taking 20 basketball students from North Carolina Basketball Club in Wuhan, Hubei Province as the experimental objects, and applying the multi-feedback teaching method to the primary basketball teaching. After 12 weeks of teaching experiments, the students' physical fitness, basketball technical movements, learning motivation, interest, attitude, learning communication, cooperation and competition consciousness in the experimental group and the control group were compared and analyzed. In terms of physical fitness, after the experiment, the average values of vital capacity, standing long jump, sitting forward and skipping rope for one minute have all improved between the experimental group and the control group, and the improvement range of the experimental group is greater than that of the control group, but the difference is not significant. In terms of basketball technical evaluation, the experimental group's basketball hand technical evaluation score is better than that of the control group with obvious difference ( $P < 0.05$ ), the experimental group's basketball leg and breathing technical evaluation score is better than that of the control group with obvious difference ( $P < 0.05$ ), and the experimental group's basketball complete cooperation technical evaluation score is better than that of the control group with obvious difference ( $P < 0.05$ ). As for learning interest, the students in the experimental group scored better than those in the control group in learning motivation, interest, attitude and communication, cooperation, competition awareness and students' recognition of teaching, and there was a significant difference ( $P < 0.05$ ). Multi-feedback teaching method is suitable for basketball teaching, which can improve the teaching effect of basketball technical movements, enhance students' motivation,

interest and attitude, and enhance students' awareness of communication, cooperation and competition. The teaching effect of multi-feedback teaching methods has been widely recognized and praised by students.

**Key Words:** Multi-feedback teaching method, Basketball teaching, Children aged 8-10

Abstract ID: OP-PE142

### **The Impact of Physical Activities on Enhancing Primary School Students' Academic Performance**

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This study aims to investigate the specific effects of physical activities on the academic performance of primary school students. Guided by the educational policies from the 20th National Congress of the Communist Party of China, which emphasize the importance of holistic development, this research seeks to provide empirical evidence supporting the integration of physical activities into the school curriculum to improve students' academic outcomes. A quasi-experimental design was employed, involving 60 sixth-grade students from a primary school in Shenzhen. The participants were divided into an experimental group ( $n=30$ ) that engaged in daily 30-minute running sessions and a control group ( $n=30$ ) that did not participate in the physical activities. Both groups followed the same teaching schedule and homework load, instructed by the same teacher. Academic performance in Chinese, Mathematics, and English was assessed at the beginning and end of the one-month study period. Data collection involved standardized academic tests administered to both groups, ensuring consistency and reliability in the measurement of academic performance. Additionally, the study incorporated qualitative feedback from teachers and students to gain insights into the perceived benefits of physical activities on learning processes and classroom engagement. Descriptive statistics and independent sample t-tests revealed significant improvements in the experimental group's academic performance across all three subjects compared to the control group. The regression analysis further confirmed the positive impact of physical activities, with significant coefficients for Chinese ( $\beta=0.52$ ,  $p<0.01$ ), Mathematics ( $\beta=0.65$ ,  $p<0.01$ ), and English ( $\beta=0.48$ ,  $p<0.01$ ). These results indicate that students who participated in regular physical activities showed marked improvements in their academic achievements, particularly in language and mathematical skills. Furthermore, the qualitative data suggested that physical activities enhanced students' concentration, motivation, and overall classroom behavior, contributing to a more conducive learning environment. The findings suggest that regular physical activity significantly enhances students' academic performance, particularly in Chinese and Mathematics. This research supports the inclusion of structured physical activities in school curricula to foster not only physical but also cognitive and academic development in students. The study underscores the multifaceted benefits of integrating physical education into the daily routine of primary school students, advocating for policy changes that prioritize physical well-being alongside academic excellence. Future research should explore



the long-term effects of physical activities on academic performance and investigate the potential differences in impact based on the type and intensity of physical activities. Additionally, expanding the study to include a more diverse sample across different regions and educational settings would provide a more comprehensive understanding of the relationship between physical activity and academic success

**Key Words:** Physical Activities, Academic Performance, Primary School, Cognitive Development, Holistic Education

Abstract ID: OP-PE219

### The influence of intervention inside and outside class on the health of obese female college students

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Obesity has become a public health problem in China and even the whole world. Obesity is one of the risk factors for many chronic diseases. The obesity rate of college students in our country is increasing year by year, and physical fitness is decreasing year by year. Therefore, we should improve the physical health level of obese students by reasonable and scientific means. Through targeted intervention in and out of class for obese female college students, this study explores the effect of intervention on students' physical health, promotes them to form healthy physical exercise habits, and provides theoretical and empirical basis for improving intervention measures. According to the obesity criteria BMI greater than 28, 40 obese female students were randomly selected as test objects. There are targeted aerobic courses in physical education, and behavior and diet guidance after physical education. The body shape, function and physical quality of the subjects were measured before and after intervention, and the changes of each index were compared and analyzed to explore the impact of intervention on students' physical health. After one semester of intervention, the body shape index of obese female college students was significantly improved ( $p < 0.01$ ), the vital capacity index of body function index was significantly increased ( $p < 0.01$ ), and the grip strength index was significantly increased ( $p < 0.05$ ). All indexes of physical fitness were significantly improved ( $p < 0.05$ ). This internal and external intervention has significant effect on the improvement of body shape, body function and physical quality of obese female college students, and has significant effect on the improvement of some psychological symptoms. It is expected to be popularized in ordinary colleges and universities.

**Key Words:** intervention inside and outside class, Obesity, Female college students, In good health

## SPORT AND EXERCISE PSYCHOLOGY

Abstract ID: OP-SP211

### Cardiac Cycle Oscillatory Dynamics In A Self-Paced Precision Task

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A gradual and transient lengthening of the cardiac cycle (cardiac deceleration) is typically observed in the few seconds leading to self-paced precision actions and is reported as a feature of expertise. This study aimed to explore the time-frequency dynamics of this phenomenon. Sixteen young adults of varying expertise (novices to experts) performed 60 golf putts at a 4-m distant target on a flat surface while their performance and electrocardiogram were recorded. We measured the intervals between consecutive R waves to examine variations in cardiac cycle length. We then applied continuous Morse wavelet transform to extract time-frequency normalized power and phase, respectively indicating the relative magnitude and the position of cardiac cycle oscillations. We used cluster-based permutation statistics to evaluate the linear correlation between cardiac cycle metrics and variable error of performance outcome as a reverse index of task precision. Greater precision was associated with cardiac cycle lengthening (cardiac deceleration) not only in the final 5 s before movement but also around 10 s before movement and even with cardiac cycle shortening (cardiac acceleration) around 5 and 15 s before movement. Time-frequency analyses revealed that greater precision was associated with (a) lower normalized power for frequency content above 0.2 Hz and below 0.08 Hz, (b) greater cross-trial consistency of both normalized power and phase, and (c) a specific oscillatory phase consistent with a 0.15-Hz cardiac cycle lengthening beginning around 2.5 s before movement. This study provides evidence that the cardiac deceleration expertise effect may be part of a broader peripheral-nervous-system phenomenon consisting of 0.08-0.2 Hz oscillations, positioned in time so that the heart rate decelerates just before and during movement.

**Key Words:** target sports, cardiac deceleration, electrocardiogram, time-frequency analyses

Abstract ID: OP-SP155

### Affective responses during low volume high-intensity interval exercise in overweight-to-obese adults: a systematic review

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Obesity is a global public health challenge, and physical exercise, as a means to increase energy expenditure, plays a crucial role in managing and reducing obesity. There is evidence that HIIE is a popular fitness approach that not only provides significant

benefits to physical health but also has an important impact on affective and psychological well-being. However, current knowledge on the changes in affective responses of overweight and obese populations during HIIE is limited. The purpose of this systematic review is to determine the impact of low volume high-intensity interval exercise (HIIE) on affective response changes in overweight and obese adults. This systematic review (PROSPERO CRD42024514591) discusses and investigates this topic. This systematic review was conducted using the PRISMA statement and Cochrane recommendations, and involved searches in three databases: PubMed, Scopus, and Web of Science. The review included 22 studies involving a total of 501 participants. According to the results, overweight and obese adults exhibit more positive affective responses to HIIE compared to MICE after exercise interventions. Despite experiencing greater exertion during HIIE, the physical enjoyment following HIIE is more pleasurable compared to MICE. However, compared to traditional high-intensity interval exercise, low volume HIIE involves shorter exercise durations or less frequent sessions, and potentially lower overall exercise volume. This results in reduced exertion during exercise, thereby allowing for greater pleasure during the exercise and enhanced enjoyment afterwards. The results of this systematic review demonstrated the positive impact of low volume high-intensity interval exercise (HIIE) on the affective responses of overweight to obese adults. For these individuals, low-volume HIIE may be a more enjoyable and sustainable exercise strategy. Therefore, promoting low-volume HIIE as a sustainable health intervention for overweight and obese adults is highly beneficial

**Key Words:** affective response, high-intensity interval exercise, overweight-to-obese

Abstract ID: OP-SP031

### **TARGET Measures, Situational Motivation and Adherence in Physical Education among Trainee Teachers**

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Physical inactivity is a growing concern among undergraduate trainee teachers due to their heavy schedules and workload which have resulted in negative health consequences. Despite studying physical education, many under-graduates still lead sedentary lifestyles and do not engage in regular physical activity. The study investigates the T.A.R.G.E.T measures, situational motivation and physical activity adherence in physical education among Physical Education trainee teachers. The study consisted of 183 males and 237 females with an age range of 18 to 23 years old ( $1.43 \pm .50$ ) from several Institutes of Teacher Education campuses. The T.A.R.G.E.T. Measures, Situational Motivation Scale and Physical Activity Adherence Questionnaire were utilized and self-administered. Descriptive analysis, independent-samples t-test, one-way ANOVA and two-way ANOVA were conducted in the study. The independent-samples

t-test revealed that there was statistically significant difference between gender on authority,  $p = .001$ , recognition,  $p = .033$ , grouping,  $p = .001$ , evaluation,  $p = .001$ , external regulation,  $p < .001$ , amotivation,  $p < .001$ , predisposing factors  $p = .001$ , and enabling factors,  $p = .019$ . Besides, the one-way ANOVA indicated that there was significant between the three teaching methods on intrinsic motivation,  $p = .006$ . Furthermore, the between-subjects ANOVA for gender and age groups showed that there was significant main effect of gender on authority,  $p < .001$ , recognition,  $p = .035$ , grouping,  $p < .001$ , evaluation,  $p < .001$ , external regulation,  $p < .001$ , amotivation,  $p < .001$ , predisposing factors,  $p < .001$ , and enabling factors,  $p = .016$ . Similarly, there was significant main effect of age groups on amotivation,  $p = .033$ . Moreover, a significant interaction between Gender vs Age was found on time,  $p = .026$ . Next, the between-subjects ANOVA for gender and teaching methods indicated that there was significant main effect of gender on authority,  $p = .002$ , grouping,  $p = .003$ , evaluation,  $p < .001$ , external regulation,  $p = .015$ , amotivation,  $p < .001$ , and predisposing factors,  $p < .018$ . Likewise, the main effect of teaching methods was significant on intrinsic motivation,  $p = .009$ . In addition, there was significant interaction between Gender vs Teaching Methods on authority,  $p = .031$ , external regulation,  $p = .041$ , and enabling factors,  $p = .035$ , respectively. The results concluded that the application of T.A.R.G.E.T approaches through a mastery motivational climate are needed in enhancing the undergraduate trainee teachers' motivation and adherence in physical education.

**Key Words:** TARGET, situational motivation, adherence, physical education, trainee teachers

Abstract ID: OP-SP054

### **Perception of Sarawakian Youth towards Physical Activity**

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Attitude has always played a pivotal role in influencing participation and engagement in physical activity, which has many advantages over one's health and mental well-being. The study investigated the attitudes toward physical activity (PA) among 510 Sarawakian youths (232 males, 278 females) aged between 17 to 22 years old ( $1.90 \pm .82$ ). The Attitude towards Physical Activity Scale was used to assess the attitudes of the youth. Descriptive analysis, independent sample t-test, one-way ANOVA, two-way ANOVA and correlation were conducted in the study. The independent sample t-test revealed that there was a significant difference between the gender in fun,  $p = .003$ , fitness,  $p < .001$ , and personal best,  $p = .012$ . Besides, the one-way ANOVA showed that there was significant difference between the three age groups in learning,  $p = .002$ , and self-efficacy,  $p < .001$ . Furthermore, the between-subjects ANOVA revealed that the main effect of gender was significant on fun,  $p = .005$ , fitness,  $p < .001$ , and personal best,  $p = .020$ , and age groups were significant on learning,  $p = .001$ , and self-efficacy,  $p = .001$ . However, there was no significant interaction between gender vs

age groups for all the APAS variables. Moreover, the findings showed a statistically significant positive relationship between the APAS variables, demonstrating moderate to high correlation ranging from .409 to .758. In conclusion, interventions involving youth and focusing on identified motivational factors can be implemented to encourage behavioral changes that increase youth participation in physical activity.

**Key Words:** attitude, physical activity, Sarawakian, youth

Abstract ID: OP-SP055

### Perceived Motivational Climate, Intrinsic and External Goals and Enjoyment of Freshman Trainee Teachers in Physical Education

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The motivational climate and motivation are crucial in sports due to their direct influence in one's engagement, effort, and enjoyment in sports. The aim of the study was to examine the motivational climate, enjoyment, intrinsic and extrinsic goals among undergraduates in sports. The participants were 324 freshman undergraduates (1.76 + .42) from two local universities in Sarawak. The Motivational Climate in Sports Questionnaire, Goal Content in Exercise Questionnaire and Sports Enjoyment Scale were utilised to measure task-and-ego involving climate, social affiliation, image, health management, social recognition, skill development and enjoyment. The independent t-test showed that there were significant difference in ego climate between male (3.84 + .91) and female (3.54 + .98),  $t(322) = 2.40$ ,  $p < .05$ ; social recognition between male (4.80 + 2.14) and female (4.38 + 1.25),  $t(322) = 2.10$ ,  $p < .05$ ; enjoyment between male (6.16 + .99) and female (5.69 + 1.11),  $t(322) = 3.30$ ,  $p < .05$ . In addition, there was no significant difference between active and non-active undergraduates. An analysis of variance (ANOVA) yielded a statistically effect among task climate,  $F(3,320) = 6.28$ ,  $p < .05$  and image,  $F(3,320) = 6.28$ ,  $p < .05$ . The post hoc tests indicated that there is a significant difference between Malay (5.95 + .78) and Chinese (5.50 + .93) in task climate and Malay (4.83 + 1.07) and Chinese (5.26 + .90) in image. The findings suggested that the universities' authorities can provide a learning and challenging environment which can lead to undergraduates' achievement and enjoyment in sports.

**Key Words:** trainee teachers, motivational climate, goals, physical education

Abstract ID: OP-SP233

### A Study on the Leisure Benefits, Work Stress, and Happiness of Middle-aged Working Women in Pingtung County

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This study aims to explore the relationships between leisure benefits, work stress, and happiness among middle-aged working women in Pingtung County, Taiwan. Additionally, it seeks to understand whether differences exist in leisure benefits, work stress, and happiness among middle-aged working women with different backgrounds. The research employed a questionnaire survey method to collect data. The questionnaire was hosted on the SurveyCake platform, and the link to the survey was distributed to qualified respondents who met the study criteria. The survey was conducted from October 1, 2022, to November 15, 2022. A total of 400 questionnaires were collected, of which 373 were valid, resulting in a response rate of 93%. Descriptive statistical analysis of the questionnaire survey can provide insights into the levels of work stress, leisure benefits, and happiness participation among respondents. The study found significant correlations among leisure benefits, work stress, and happiness. Additionally, different background variables (marital status, education, occupation, income, etc.) significantly influenced happiness, with notable differences existing among the three sets of variables. Leisure benefits and happiness showed a negative correlation (-0.22\*) with work stress, indicating that higher levels of leisure benefits and well-being are associated with lower levels of work stress. Furthermore, happiness and leisure benefits were positively correlated (0.53\*), suggesting that higher leisure benefits are associated with higher levels of happiness. Based on the findings, the government should encourage and fund community centers, women's groups, and other organizations to regularly organize leisure activities suitable for middle-aged women, such as yoga classes, fitness sessions, and craft workshops, to enhance their leisure benefits. These initiatives can play a crucial role in reducing work stress and improving overall happiness and well-being.

Keywords: working women, happiness, work stress, leisure benefits

Abstract ID: OP-SP035

### Fitness and Attitude Assessment of Elementary School Girls

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The increasing population of overweight children poses a significant public health concern due to the escalating occurrence of non-communicable diseases. The health of children is often overlooked, leading to potential repercussions on their overall well-being and mental health during childhood. In

light of the limitation of studies in single-gender girls' schools and females spending less time in physical activity has led to this study in examining health-related physical fitness and attitude among elementary school girls (N = 141) aged between 10 to 12 years old (2.09 + 0.81). The National Physical Fitness Standard (SEGAK) test battery was utilised to determine the physical fitness level in terms of Body Mass Index (BMI), muscular endurance, muscular strength, flexibility and cardiovascular endurance. Whereas, the Students' Attitude toward Fitness Testing questionnaire was used to measure the students' attitude towards fitness testing. Descriptive analysis was used. In the BMI test, the majority of the participants were in the normal weight BMI, followed by overweight, underweight and obese BMI. There were more 12 year olds having normal weight BMI as compared to the 10 years old and 11 years old. However, there were more 10 year olds than 11 and 12 years old in the underweight BMI. Furthermore, 11 year olds were more overweight and obese than the 10 and 12 years old. Whereas, in the SEGAK test, the majority of the participants performed at an excellent level, followed by fit, poor, superior and below average level of fitness. There were more 11 years old than the 10 and 12 years old in the superior, excellent and below average level of fitness. Conversely, 12 years old was more fit and had a poor level of fitness as compared to the 10 and 11 years old. Results showed that 12 years old revealed higher cardiorespiratory as compared to the 10 and 11 years old in the step test. However, 10 years old revealed higher muscle strength and flexibility as compared to the 11 and 12 years old in the push-ups test and sit and reach test. Moreover, 11 years old revealed higher muscle endurance as compared to the 10 and 12 years old in the curl-ups test. The cognitive (4.09 ± 0.93) were the most important construct that influenced the students' attitude toward fitness testing, followed by affect-feelings (4.09 ± 0.93), affect-enjoyment (3.95 ± 0.97) and affect-teacher (3.71 ± 0.78). The school authorities need to create suitable intervention activities and programs by providing time-frame, deadlines and monitoring to ensure that the interventions are implemented successfully.

**Key Words:** Fitness, elementary girls, attitudes, physical education

Abstract ID: OP-SP028

### Perception of Elementary School Pupils Expectancy Beliefs, Task Values and Anxiety in Physical Education

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The importance of physical education in fostering healthy habits and encouraging physically active lifestyles for pupils and youth has the potential to enhance an individual's expectancy beliefs and reduce the anxiety level in carrying out the physical activity. The study examined 480 primary school pupils (234 males and 246 females) expectancy beliefs, task values and anxiety aged between 10 to 12 years old (1.96 ± .82) from Year 4 to Year 6 in Kuching, Sarawak. The Expectancy-Value Model Questionnaire and Physical Education Classroom Anxiety Scale were utilised to examine the pupils' expectancy beliefs, task values

(attainment, utility, intrinsic, cost) and anxiety towards physical activity during Physical Education classes. Descriptive analysis, independent-samples t-test, one-way ANOVA and two-way ANOVA were utilized. The independent-samples t-test revealed that there was significant difference between male and female on expectancy beliefs,  $p = .001$ , attainment,  $p = .007$ , utility,  $p = .002$ , intrinsic,  $p = .045$ , fear of negative evaluation,  $p = .030$ , and test anxiety,  $p = .004$ . Besides, the one-way ANOVA revealed significant difference between the three age groups on expectancy beliefs,  $p = .045$ , utility,  $p = .019$ , and cost,  $p = .009$ . Moreover, the between-subjects ANOVA revealed significant main-effect of gender on expectancy beliefs, attainment, utility, fear of negative evaluation and test anxiety with  $p$ -value  $< .05$ . Lastly, results also showed significant main-effect of age group on expectancy beliefs, utility and cost with  $p$ -value  $< .05$ . In addition, there were significant interaction between Gender vs Age on cost,  $p = .006$ , communication apprehension,  $p = .028$ , and fear of negative evaluation,  $p = .008$ . The study's findings suggest that physical activity's interventions that prioritize beliefs, task values, and cost reduction would lead to reduce anxiety, improved performance and long-term sustainability.

**Key Words:** expectancy beliefs, task values, anxiety, physical education, physical activity

Abstract ID: OP-SP208

### Validation of the Chinese Version of the Academic and Athletic Identity Scale (AAIS) Among university student-athletes

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University athletes have dual roles as students and athletes, and their identities affect not only sports performance but also engagement and success in the academic arena. Understanding and balancing these two types of identities is critical to improving the overall development and well-being of student-athletes. The purpose of this study was to validate the Chinese version of the Academic and Athletic Identity Scale (AAIS) using confirmatory factor analysis among Chinese university student-athletes. A sample of 1025 Chinese university student-athletes, with a mean age of 20 years (SD = 1.54), comprising 65% male participants, volunteered and participated in this study. The AAIS, featuring two factors- academic identity and athletic identity, was translated into Chinese and administered to university student-athletes. Subsequently, Mplus 8.0 was employed for a rigorous factor analysis. Confirmatory factor analysis based on the original AAIS model structure, revealed a favorable model fit based on the RMSEA (Root Mean Square Error of Approximation) and SRMR (Standardized Root Mean Square Residual) fit indices CFI = 0.978, TLI = 0.971, SRMR = 0.019, and RMSEA (90%CI) = 0.053(0.045, 0.062), all item loadings exceeded 0.4. Moreover, the AVE of each construct is more than 0.6. The constructions' construct reliability was higher than 0.70, indicating sufficient convergent validity. The correlation between academic identity and athletic identity is negative ( $r = -0.196$ ), indicating discriminant validity. The Chinese version of the



Academic and Athletic Identity Scale (AAIS), was found to be a valid and reliable instrument for the assessment of identity among Chinese university student-athletes.

**Key Words:** Identity, Student-athletes, Validation

## SPORT BIOMECHANICS AND TECHNOLOGY

Abstract ID: OP-BT075

### Fall Risk Prediction Model Based on Machine Learning Among Middle-Aged and Older Adults in Rural China: Results from the China Health and Retirement Longitudinal Study

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Falls among older adults can be particularly devastating, especially for rural populations. Currently, accurate predictive models for fall risk among older adults in rural China are lacking. This study aims to develop a predictive model for falls and fall-related injuries among older adults in rural China. We conducted a prospective cohort study of 4,354 older adults (aged 60 and above) enrolled in the China Health and Retirement Longitudinal Study (CHARLS) between 2018 and 2020 to develop and validate this prediction model. Several machine learning algorithms (logistic regression, k-nearest neighbors, naive Bayes, multilayer perceptron, random forest, and XGBoost) were used to assess the 3-year risk of falling. The optimal cutoff points and adjustment parameters are explored in the training set, the prediction accuracy of the models is compared in the testing set, and the best-performing models are further interpreted. Over the 3-year follow-up, 1,075 (24.68%) older individuals experienced falls. LASSO regression identified 10 significant features for the model for 48 features. Among 6 machine learning models, XGBoost showed the best performance with a ROC curve of 0.810, accuracy of 0.760, sensitivity of 0.795, F1 score of 0.790, and specificity of 0.715. Decision curve analysis indicated XGBoost had the highest net benefit in most threshold ranges. SHAP analysis identified the top five features as fall history, age, physical activity ability, grip strength, and walking speed, illustrating their effects on the model's output. Machine learning-based prediction models can accurately evaluate the likelihood of falls in older adults over a period of 3 years. A combination of XGBoost and SHAP can provide clear explanations for personalized fall risk prediction and offer a more intuitive understanding of the effect of key features in the model.

**Key Words:** Falls, Rural area, Predictive mode, Machine learning, CHARLS

Abstract ID: OP-BT093

### The friction moment counteracts the ground reaction force driven tibial rotation moment at foot impact phase of cuttings

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The ground reaction force (GRF) is known to produce tibial internal rotation loading associated with the stress in the anterior cruciate ligament (ACL). However, it is unclear whether the friction moment (FM; the moment due to horizontal shoe-floor friction, acting around the vertical axis at the GRF acting point) facilitates or restrains the effect of GRF-driven tibial rotation loading during cutting. This study aimed to clarify the impact of FM on the tibial rotational dynamics during cuttings, focusing on the rotational orientation relationship between FM- and GRF-driven tibial rotation moment. The 45°cutting motions were captured simultaneously with GRF and FM data from 23 healthy males. The FM- and GRF-driven tibial rotation moments were calculated. The time-series correlation between FM- and GRF-driven tibial rotation moments and the orientation relationship among those moment vectors were investigated with regression slope analysis with statistical parametric mapping one-sample t-test ( $p < 0.05$ ). The FM-driven tibial rotation moment negatively correlated with the GRF-driven one within the first 10 % of the stance phase. The peak regression slope value was  $-0.34$  [SD 0.33] for forefoot and  $-1.64$  [SD 1.76] for rearfoot strikes, showing a significant difference from zero (statistical parametric mapping one-sample t-test,  $p < 0.05$ ). In most trials, the FM-driven tibial "external" rotation moment counteracted the GRF-driven tibial "internal" rotation moment within the first 10 % of the stance phase. The results suggested that the FM-driven tibial rotation moment potentially diminishes the effect of the GRF-driven one and may reduce the risk of ACL injury at the foot impact phase of cuttings.

**Key Words:** Autonomic function, diurnal timing, exercise, high-intensity interval training

Abstract ID: OP-BT0160

### Association between tennis court surface type and landing impact on the step

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The occurrence rate of lower limb injuries in tennis players depends on the type of court surface, with the highest rate occurring on hard courts. Landing impact was also related to the rate of lower limb injuries, and the rate was 17.6% higher on hard courts than on clay courts during tennis rallies. However, tennis contains some specific tennis movements, and the landing impact of these movements has not yet been examined. This study aimed to confirm the differences in landing impact between hard and clay courts using four tennis movements. This study included 21 healthy college tennis players (male,  $n=10$ ; female,  $n=11$ ). The task movements were dash, retro-running, slide and cross steps on hard and clay courts. The landing impact was measured through acceleration during four tasks using smart shoes (ORPHE CORE 2.0+; ORPHE, Tokyo, Japan). The coefficient of restitution for each court was calculated by the

vertical bounce height of a golf ball. For statistical analysis, a paired t-test was conducted to compare the landing impacts between the two courts. The landing impact on hard court was significantly higher than clay court about 10% for all tasks: dash ( $9.3 \pm 1.9$  G vs.  $8.4 \pm 2.0$  G,  $p < 0.05$ ), retro-running ( $8.1 \pm 1.9$  G vs.  $7.6 \pm 1.9$  G,  $p < 0.05$ ), slide step ( $7.7 \pm 1.8$  G vs.  $6.9 \pm 1.4$  G,  $p < 0.05$ ), and cross step ( $8.0 \pm 1.7$  G vs.  $7.3 \pm 1.6$  G,  $p < 0.05$ ). The coefficient of restitution was twice as high for hard court (0.86) as for clay court (0.43). In this study, landing impact and coefficient of restitution were greater on hard courts. This result suggests the theory from previous research the coefficient of restitution is positively correlated with landing impact remains present in specific tennis movements. The difference between coefficient of restitution and landing impact indicates the human body absorbs the impact.

**Key Words:** Smart shoes, Tennis court surface, Landing impact, Tennis movements

Abstract ID: OP-BT70

### A Biomechanical Analysis of the Kick Leg Action in Children's Ballroom Dancing

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This study used an 8-camera infrared optical motion capture analysis system (BTS Bioengineering) to test the kick leg action of 30 children's Latin dance athletes (9-11 years old group: 15 people, 12-14 years old group: 15 people) and obtained kinematic indicators such as joint angles, phase joint angle change trends, and time characteristics of each stage of the action. The results show that: (1) From the time characteristics, there is a significant difference in the time ratio of the right leg retraction stage in the entire kick leg action cycle between the two groups of children athletes ( $P < 0.05$ ), and the time ratio of the right leg retraction stage in the entire kick leg action of the 12-14 years old group is smaller than that of the 9-11 years old group. (2) From the knee joint angle, the flexion angle of the power leg knee joint in the kick-out moment of the 9-11 years old group is smaller than that of the 12-14 years old group, and the flexion angle of the power leg knee joint in the kick-out moment of the 9-11 years old group is below 0 degrees; there is a significant difference in the left knee joint angle of the two groups of children athletes at the moment of kicking out ( $P < 0.05$ ). (3) From the hip joint angle, there is no significant difference in the hip joint angle of the two groups of children athletes in each stage of the kick leg action; there are obvious differences in the hip joint angle change trend. (1) Strengthening of the core muscles can better utilize the hip joint to maintain stability and improve the speed of the kicking phase.

(2) In the kick-out moment, the knee flexion angle of the 9-11 age group was all below 0 degrees, indicating knee hyperextension, which makes it easier to suffer injuries to the anterior cruciate ligament and the knee. (3) In the lifting knee stage, a too large hip flexion angle of the leading leg may cause the body center of gravity to lean forward after completing the action, which is not conducive to energy accumulation in this action stage, and a too small hip flexion angle may cause the body to lean back,

affecting the speed of kicking action completion. In the 12-14 age group, the hip flexion angle decreased and then showed an upward trend, indicating that the upper limbs were basically in a stable posture.

(4) In the kicking action, the leading leg's toe flexion is used to maintain the body posture when the leading leg is propelled forward, and the stronger the ankle joint flexion strength, the higher the stability.

**Key Words:** Children Ballroom Dance, Kicking Action, Biomechanics of Sports, Kinetics

Abstract ID: OP-BT0161

### COMPARATIVE ANALYSIS OF ON-FIELD TACTICAL BEHAVIOR IN MALAYSIAN ELITE AND STATE-LEVEL YOUTH SOCCER PLAYERS

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Youth soccer represents a critical phase in player development, where tactical behavior significantly influences both team performance and individual advancement. This study investigates the on-field tactical behaviors of sub-elite national and state elite youth soccer players in Malaysia, focusing on key tactical elements such as possession, passing patterns, defensive strategies, and player movements. The objective is to uncover differences between these levels to enhance coaching practices and player development. A descriptive approach was employed, utilizing video analysis of four teams from the KPM Under-17 League: one sub-elite national team and three state elite teams aged  $15.5 \pm 0.75$  years. Tactical behaviors were assessed through systematic review of video recordings using Longomatch applications, with coding divided into offensive and defensive criteria. Results indicate notable tactical differences between the groups. The sub-elite national team demonstrated a balanced style with effective possession and defensive metrics, including 123 passes and 48.31 minutes of possession. In contrast, the state elite-1 team exhibited a more aggressive approach, with 258 passes and high attacking metrics. State elite-2 and state elite-3 teams showed stronger defensive strategies, with state elite-2 achieving the highest defensive success rate. These findings illustrate varying tactical strategies among teams. The sub-elite national team's balanced approach aligns with literature emphasizing the importance of ball control and tactical equilibrium. Conversely, the state elite-1 team's aggressive tactics reflect a focus on high-pressure play, while state elite-2's superior defensive metrics highlight the value of strong defensive orientation. The state elite-3 team maintained a defensively inclined but balanced approach. Overall, this study underscores the necessity of integrating both offensive and defensive skills in youth soccer training programs. Tailoring coaching strategies to emphasize a balanced tactical development can better prepare players for competitive challenges at higher levels.

**Key Words:** tactical analysis, youth soccer, elite players, state-level players, performance enhancement

# SPORT AND EXERCISE PSYCHOLOGY

Abstract ID: YIA-SP025

## Development Path Model for Under-17 Football Players in Indonesia and Malaysia: Insights from Sport Psychology

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This study was conducted to explore the issues and challenges of the development path of Indonesian and Malaysian under-17 soccer players, as well as identify psychological characteristics that can help under-17 soccer players maintain the continuity of their performance into adulthood. The ultimate goal is to build a model for developing soccer players under 17 in Indonesia and Malaysia. This study uses a qualitative method with a grounded theory approach. A total of 25 football coaches, consisting of 10 coaches from Indonesia and 15 coaches from Malaysia, participated in this study, and the criteria were having a coaching license and at least five years of coaching experience. When collecting research data, researchers used three methods: open-ended semi-structured interviews, observation, and document analysis to ensure the coaches provided accurate information. The results of the study show that there are three themes of problems in the development path, namely facilities, coach's ability, and ideological transformation. In addition, there are also four themes of challenges for the development of football players, namely physical, technical, tactical, and psychological conditions. Other results show that there are two significant themes related to the psychological characteristics that soccer players need in development, namely individual psychological characteristics and environmental psychological characteristics. The nine themes obtained in this study are used to produce a more integrated, holistic, and practical development model for Indonesian and Malaysian under-17 soccer players. This model is expected to be used as a reference by football stakeholders in each country to create a development program for football players under 17 years of age.

**Key Words:** Football, Model, Development, Indonesia, Malaysia

Abstract ID: YIA-SP027

## Neurobiological Mechanisms Underlying Coordinated Actions in Joint Action

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The coordination of actions in joint action significantly impacts various aspects of daily life. Previous research, utilizing parameters derived from behavioral dynamics, revealed that an individual's jumping behavior is influenced by the proximity of their partner's jump, implying a potential role of action simulation in interpersonal coordinated actions. This study employs functional near-infrared brain imaging technology to directly investigate the neural mechanisms associated with coordinated actions in joint action. Using a modified joint jumping task,

participants were instructed to jump varying distances without observing their partner's actions, aiming to achieve a collaborative goal of landing simultaneously. Concurrently collecting behavioral parameters related to jumping, we synchronized the acquisition of cerebral hemodynamic data. At the neural activity level, within the motor-related cortex, regardless of whether one jumped closer or farther, this region exhibited higher concentrations of oxygenated hemoglobin compared to the condition with both participants jumping the same distance. In the dorsolateral prefrontal cortex, only when one needed to jump closer did a higher concentration of oxygenated hemoglobin emerge. The dorsolateral prefrontal cortex, associated with action coordination strategies, and the motor-related cortex may be directly linked to action simulation.

**Keywords:** Joint action, Action coordination, Prediction, Action simulation, fNIRS

Abstract ID: YIA-SP083

## Gender differences in adolescent participation of football: A study based on the Theory of Planned Behavior

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Regular participation in football has been found to have several benefits for the healthy development of adolescents, such as improving physical fitness, promoting mental health and enhancing cognitive function. Compared to research on boys' participation in football, there is currently less research focused on girls. This study is based on the Theory of Planned Behavior (TPB), investigating the factors influencing the participation of adolescent in football and exploring the role of gender in it. The study surveyed students from 3 primary schools and 10 junior high schools. Our study analyzes data from 1,147 adolescents (age range= 8 to 16 years, M age= 12.52, SD= 1.506) using Structural Equation Modeling (SEM). We conducted structural equation model testing on the samples. The SEM analysis showed adequate fit with the data,  $\chi^2 = 1602.492$ , CFI = .953, TLI = .947, and RMSEA = .044 and SRMR = .030. The model exhibited adequate fit. Attitudes can predict behavioral intentions ( $\beta = .177$ ,  $p < .001$ ), subjective norms can predict behavioral intentions ( $\beta = .215$ ,  $p < .001$ ), perceived behavioral control can predict behavioral intentions ( $\beta = .492$ ,  $p < .001$ ), past behavior can also predict behavioral intentions ( $\beta = .115$ ,  $p < .001$ ), past behavior can also predict behavior ( $\beta = .079$ ,  $p < .001$ ), and behavioral intentions predicting behavior ( $\beta = .927$ ,  $p < .001$ ). Behavioral beliefs ( $\beta = .693$ ,  $p < .001$ ) can predict attitudes, both normative beliefs ( $\beta = .465$ ,  $p < .001$ ) and compliance motivations ( $\beta = .543$ ,  $p < .001$ ) can predict subjective norms, both control beliefs ( $\beta = .772$ ,  $p < .001$ ) and perceived intensities ( $\beta = .224$ ,  $p = .011$ ) can predict perceived behavioral control. Then, gender ( $\beta = 2.000$ ,  $p < .001$ ) and age ( $\beta = 1.304$ ,  $p = .017$ ) moderate the relationship between past behavior to intentions. The results revealed that: (1) Attitude, subjective norms, perceived behavior control and past behavior can predict behavioral intention, past behavior and intention can predict

behavior. (2) Gender and age moderate the relationships between past behavior and behavioral intention. The results of the study emphasize the importance of attitude, subjective norms, perceived behavioral control, and behavioral intention in adolescent participation in football sports. Further research explores gender and age differences in the main paths of the Theory of Planned Behavior model and finds that gender and age play a moderating role in the pathway of past behavior and behavioral intention. This finding indicates that there are some differences between boys and girls in their understanding of football sports, and boys participate more actively than girls. This result suggests that we should consider how to translate girls' recognition of football sports into active participation. The findings of this study provide a reference for related research and interventions in adolescent football sports.

**Keywords:** Football, Adolescent, Gender Differences, Planned Behavior Theory, Structural Equation Modeling

Abstract ID: YIA-SP095

### **The Effect of Carbonated Carbohydrate Mouth Rinsing on Prolonged Running Performance Among Trained Runners**

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Carbohydrate (CHO) mouth rinsing has been shown to activate the oral receptor that is related to the reward and behavioral center of the brain that contributed to enhancing exercise performance. This research investigates the effect of carbonated carbohydrate (C-CHO) mouth rinse on prolonged running performance in time to exhaustion. In the present study, we examined the effect of three different solution which is carbonated beverages contain 6% of electrolyte and 5.4% glucose while non-carbonated carbohydrate (NC-CHO) contains 4% of glucose or placebo (PLA) contains no glucose, only electrolyte. Participants will be given C-CHO or NC-CHO or PLA with using syringe then participants swirl the fluid for 10 seconds before spit into a beaker. Mouth Rinsing will be administered in warm-up and 15-minute intervals during time to exhaustion running. Twelve healthy male recreational runners were selected for this randomized design and double blinded. Each participant will perform a time to exhaustion running exercise at speed equivalent at 70% VO<sub>2</sub>max (determined during first visit). Running time to exhaustion performance for C-CHO was significantly longer ( $p < 0.05$ ) in each trial. However, the longer time to exhaustion with different solutions in order effect did not reach statistical significance ( $p = 0.196$ ). Exhaustion time in VO<sub>2</sub>max and rate perceived exhaustions with C-CHO, showed no significant difference ( $p = 0.885$ ) in comparison with NC-CHO and PLA trial. Heart rate, oxygen uptake, plasma insulin, glucose, lactate in the C-CHO, NC-CHO and PLA were not significantly different in time to exhaustion. Rate perceived exhaustions in the C-CHO, NC-CHO and PLA were not significantly different in each running performance trial. Meanwhile, the activation scale increased significantly during exercise in each 15 min TTE and each trial. Gastrointestinal discomfort was not reported during endurance performance in all trials. From the current study, it

could be concluded that rinsing C-CHO did not significantly improve performance in prolonged running when compared to NC-CHO and PLA.

**Key Words:** mouth rinsing, exercise performance, time to exhaustion

Abstract ID: YIA-SP120

### **An intervention study on the effect of positive thinking training on the learning of general tennis motor skills of physical education students**

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In sports practice, athletes and coaches have recognised the role of positive thinking psychological intervention methods in improving athletes' performance. Based on the psychological intervention effect of accepting the psychological intervention method of positive thinking on the learning of tennis comprehensive skills in sports majors, we discuss the feasibility of applying positive thinking training to the tennis comprehensive course of sports majors in colleges and universities. A total of 70 students in 2 classes of physical education majoring in grade 21 were selected as experimental subjects, and divided into experimental group and control group according to the natural grouping of teaching classes equally. The experimental group combined the concepts and methods of positive thinking training with traditional teaching methods, conducted a 16-week teaching experiment of learning the four basic tennis techniques in one semester, and collected the students' positive thinking level and tennis technique test scores before and after the experiment. Before and after the experiment, there was no significant change in the level of positive thinking in the control group ( $p > 0.5$ ), while the level of positive thinking in the experimental group increased significantly compared to the pre experiment ( $p < 0.5$ ). At the end of the experiment, comparing the tennis skill levels of the two groups of students, it was found that their differences in the four skills were more obvious, with the score of the experimental group ( $t = -6.706$ ,  $p < 0.001$ ) higher than that of the control group ( $t = 1.728$ ,  $p > 0.05$ ). The difference in the level of tennis skills between the two groups is very obvious, indicating that the experimental group scored significantly higher after the experiment than before the experiment. Conclusion: (1) Positive thinking training can improve students' positive thinking level and promote students to pay attention to the present moment and focus on the perception of the internal and external environments of the body and mind (2) In positive thinking training, the behavioural experience of the practitioner's attention to the present moment is sufficient for the practitioner to perceive changes in the internal and external environments.

**Key Words:** Physical education students, Positive thinking training, Tennis motor skills, Learning intervention, affection



## The Relationship between Social Support, Reinforcement and Physical Activity Behavior

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Research has consistently demonstrated that reinforcement strategies can positively influence exercise adherence. Similarly, strong social support networks have been shown to enhance exercise participation. Despite evidence for the individual effects of reinforcement and social support on exercise adherence, their combined impact remains understudied. The main aim of this study was to explore the association between reinforcement, social support and physical activity engagement among TAR UMT students. A total of 363 University students (172 Males, 191 Females; mean age=20.13 years; SD=1.92) from Tunku Abdul Rahman University Management & Technology, KL Main Campus participated in this research. Participants completed surveys of Demographic data, International Physical Activity Questionnaire-Short form ( $r = .56$ ), Perceived social support questionnaire, and Reinforcement sensitivity theory personality questionnaire. Pearson correlation analysis revealed there was significant positive correlation, moderate link between Behavioral Approach System and Perceived Social Support (PSS). Within Social Support, Significant Other was found to have highest association ( $r=0.38$ ) compared to Friends ( $r=0.37$ ) and Family ( $r=0.32$ ),  $p=0.00$ . A non-significant positive correlation, weak link between Behavioural Inhibition System and PSS was found. Within Social Support, Friends was found to have highest association ( $r=0.03$ ,  $p=0.56$ ), compared to Significant Other ( $r=0.01$ ,  $p=0.76$ ) and Family ( $r=-0.02$ ,  $p=0.60$ ). A non-significant negative correlation, weak link between PSS and physical activity (PA) was found. Within Social Support, Significant Other was found to have highest association ( $r=-0.071$ ,  $p=0.17$ ), compared to Friends ( $r=-0.070$ ,  $p=0.181$ ) and Family ( $r=-0.052$ ,  $p=0.322$ ). A relationship between reinforcement and PSS is seemingly established. This is due to a significant relationship between BAS and PSS, meaning positive reinforcement may be related to social support. Past studies found PSS and PA to be linked. This means reinforcement may also be crucial in helping individuals engage in PA where further studies are needed to investigate reasons and nature of relationship. Reinforcement could be recommended as a future intervention strategy to help individuals engage in PA.

**Key Words:** reinforcement, physical activity, social support, exercise behaviour, exercise adherence

## Undergraduate-athletes' motivation and identity in academics and sports

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This is a quantitative approach in understanding undergraduate-athletes' motivation and identity within the Institute of Teacher Education Malaysia Campuses which are deemed important due to the challenges in balancing their academic and sports pursuits. The Student Athletes' Motivation Toward Sports and Academics Questionnaire and Academic and Athletic Identity Scale were used to measure 145 undergraduates-athletes (76 males, 69 females) across 3 age groups of 19 - 20, 21 - 22 and 23 - 24 years old in terms of their motivation and identity towards academics and sports. Descriptive analysis, independent sample t-test and one way ANOVA were conducted. Results revealed that there was no significant difference between gender on academic motivation,  $p = .967$ , student athletic motivation,  $p = .228$ , career athletic motivation,  $p = .071$ , academic identity,  $p = .502$  and athletic identity,  $p = .903$ . Besides, the one-way ANOVA revealed that there was significant difference between age groups of 19 - 20 and 23 - 24 on athletic identity,  $p = .003$ . Conversely, there were no significant difference between age groups on academic motivation,  $p = .142$ , student athletic motivation,  $p = .151$ , career athletic motivation,  $p = .321$  and academic identity,  $p = .099$ . The findings indicated that supportive and nurturing initiatives by adopting cooperative learning based on similar abilities and goals can help the undergraduate-athletes to stay committed to both their academic and athletic endeavour.

**Key Words:** Identity, motivation, Undergraduate

## The Relationship between Learning Engagement and Peer Support among University Swimming Beginners: The Mediating Roles of Achievement Goal Orientation and Self-Efficacy

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In order to enhance the teaching efficiency of general swimming courses in universities, this study explores the relationship between beginners' learning engagement and peer support, the role of achievement goal orientation, and the regulatory effect of self-efficacy from the perspective of educational psychology. The study employed questionnaires on learning engagement, peer support, achievement goal orientation, and self-efficacy to survey beginners in general swimming courses at universities in Guangdong, Guangxi, Hainan, Hunan, Jiangxi, Fujian, and other provinces of China, resulting in 1,192 valid questionnaires. Results: (1) There is a positive correlation between learning engagement and peer support among university swimming beginners ( $r=0.487$ ,  $p<0.05$ ); (2) Both mastery goal orientation and performance goal orientation have mediating effects between learning engagement and peer support; (3) The relationship between achievement goal orientation and learning engagement is moderated by self-efficacy, with beginners

having high levels of self-efficacy exhibiting greater learning engagement. The learning engagement of university swimming beginners can directly affect peer support, and can also indirectly influence it through achievement goal orientation moderated by the level of self-efficacy. In the teaching of general swimming courses in universities, attention should be paid to guiding the learning interest and enthusiasm of beginners and stimulating their sense of self-efficacy.

**Keywords:** University Swimming Beginners, Learning Engagement, Peer Support, Achievement Goal Orientation, Self Efficacy

## SPORT MEDICINE AND ATHLETIC TRAINING

Abstract ID: OP-SM002

### Does Short-Duration Static Stretching Exercise Affect Dynamic Balance in U-14 Female Athletes?

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The aim of this study is to investigate the effect of short duration of static stretching exercises on dynamic balance (i.e., frontal, and sagittal balance on wobble board) after different recovery time (i.e., immediately, after 2 and 10 minutes) in young female athletes. Thirteen volunteer U-14 female athletes agreed to participate in this study. This study is made up of eight random assessments on a separate day successively. Each of the assessments was a 2D kinematic analysis of frontal and/or sagittal balance of the centre of mass displacement, velocity, and acceleration on wobble board without and/or after a stretching exercise session with variable recovery times (i.e., immediate, after 2 min, and after 10 min). ANOVA with repeated measures on 1 factor showed a significant difference ( $p < 0.05$ ) between sessions (i.e., without stretching, immediately after stretching, after 2 minutes and 10 minutes rest of stretching session) in the velocity and acceleration of the COM ( $p < 0.05$ ) in frontal and sagittal plane sway. Our findings showed that short-duration static stretching exercises yield positive effects on the dynamic balance of young female athletes U-14. These exercises lead to improved stability, particularly when focusing on the FB condition on a wobble board (Costa et al., 2009; Denerel et al., 2019; Ghaffarinejad et al., 2007; Nelson et al., 2012). However, in SB condition, short-duration static stretching did not contribute positively to enhancing stability. Furthermore, the most favourable effects on dynamic balance are observed immediately after a short duration static stretching in the FB condition. Ultimately, the duration of static stretches is a crucial factor, with stretches lasting less than 30 seconds demonstrating an optimal impact on dynamic balance. This makes them suitable for activities such as warm-ups and other methods aimed at enhancing stability.

**Key Words:** Short Duration, static stretching, dynamic balance, female athlete

Abstract ID: OP-SM036

### Effects of 2-day Acute IHT and IHHT on Anaerobic Metabolism

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For competitive sports, the primary goal of training is to enhance the anaerobic metabolism of muscles. Specifically, the adenosine triphosphate-phosphocreatine (ATP-PC) system is the main energy pathway of acyclic sports. This study aims to investigate the acute effects of introducing hypoxia and hyperoxia episodes into high-intensity interval training (HIIT) programs on the lactic acid and ATP-PC systems. Nine healthy adult athletes (age,  $21 \pm 3.7$  years; height,  $173.8 \pm 9.4$  cm; weight,  $70 \pm 9.3$  kg) participated in our experiment. The procedure was divided into three phases: a preliminary phase for reference training intensity assessment, a 2-day intermittent hypoxia training (IHT) phase, and a 2-day intermittent hypoxia hyperoxia training (IHHT) phase; in addition, each phase was followed by an ATP-PC test for biological parameter collection. The reference training intensity was assessed based on the average speed of 30-m sprint. In the 2-day IHT/IHHT training, the training intensity was set as 80% of the sprint speed with a hypoxia environment ( $O_2$ -13%) for IHT and a hyperoxia environment ( $O_2$ -80%) for IHHT. Meanwhile, for the ATP-PC test, the training intensity was set as 90% of the sprint speed. Comparing the tests before and after a 2-day training phase, the difference in means of the maximal lactate accumulation rate (VLamax) is -9% for IHT and -6.8% for IHHT; similarly, the difference in means of the lactate formation rate is -19.0% for IHT and -18.8% for IHHT. Our study indicates that the 2-day IHT/IHHT training induces quick response to acute regulation, showing significant reduction in both VLamax and lactate formation rates. Our findings reveal a previously undiscovered adaptation mechanism of muscle energy systems under hypoxia conditions. The results can be applied to acyclic sports to quickly improve the ATP-PC metabolism and storage.

**Key Words:** Adenosine triphosphate-phosphocreatine (ATP-PC), maximal lactate accumulation rate (VLamax), lactate formation rate, anaerobic metabolism

Abstract ID: OP-SM078

### Development of a Predictive Model for Frailty Risk in Healthy Older Adults Over 3 Years Using Machine Learning Algorithms: A Study from CHARLS

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Predicting frailty risk in healthy older adults is essential for timely interventions and improving quality of life. Early identification of high-risk individuals allows for preventive measures and

personalized care. This study aims to develop a machine learning model to assess frailty risk using longitudinal data from the China Health and Retirement Longitudinal Study (CHARLS). A cohort study was conducted with 4,228 older adults from CHARLS between 2015 and 2018. Participants were aged 60 years and above, non-frail at baseline and changes in frailty status were assessed by evaluating the frailty status at baseline and at the second survey conducted two years after the baseline. Various machine learning algorithms were employed to predict the 3-year risk of frailty, including logistic regression, k-nearest neighbors, naive Bayes, multilayer perceptron, random forest, and XGBoost. LASSO regression identified 11 key features for the model. Models were evaluated using accuracy, sensitivity, specificity, F1 score, and ROC-AUC. The best-performing model, logistic regression, was interpreted using nomograms to visualize predictor importance. Over 3 years, 778 (18.42%) of the healthy older adults developed frailty. The logistic regression model outperformed others, with an ROC-AUC of 0.780, accuracy of 0.740, sensitivity of 0.765, specificity of 0.720, and F1 score of 0.750. The 10 key features identified included: Age, Average grip strength of both hands, Body Mass Index (BMI), Walking speed, Number of chronic diseases, Cognitive function, Physical activity levels, social engagement, psychological well-being, Sleep quality. The logistic regression model effectively predicts frailty risk in older adults over a 3-year period. Nomograms provide clear insights into key predictors, aiding personalized risk assessment and intervention planning. Early identification of frailty risk can lead to targeted interventions, improving health outcomes and quality of life for older adults.

**Key Words:** Autonomic function, diurnal timing, exercise, high-intensity interval training

Abstract ID: OP-SM080

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**Research on Assessing Functional Defects and Predicting Injury Risks of College Street Dance Enthusiasts Based on YBT - A Case Study of Quanzhou Region**

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Through the YBT assessment method, systematically analyze the functional performance and differences in core stability, limb flexibility, and muscle strength among dancers of different dance genres among college street dance enthusiasts in the Quanzhou area, and comprehensively understand their potential flaws and deficiencies. With the help of YBT assessment results, combined with data analysis and statistical methods, accurately predict the potential sports injury risks that college street dance enthusiasts may face during practice, and provide them with targeted prevention and rehabilitation suggestions. Develop personalized training plans and guidance programs to help them improve functional performance and reduce the risk of sports injuries. Provide scientific health management measures for this group to promote the healthy development of street dance culture in the Quanzhou area. Select street dance enthusiasts from several colleges in the Quanzhou area as the research subjects, and obtain data of a total of 43 street dance enthusiasts. Use the Y

Balance Test (YBT) as a functional assessment tool to evaluate the functional performance such as core stability, limb flexibility, and muscle strength of the research subjects. Use SPSS27 statistical software to analyze the YBT test results and compare the average values and distribution of different indicators among college street dance enthusiasts in the Quanzhou area. There was no significant difference in the bilateral upper extremity reach differences related to gender ( $P = 0.373$ ,  $P > 0.05$ ,  $t = -0.901$ ), and there was no significant difference in the bilateral lower extremity reach differences related to gender ( $P = 0.729$ ,  $P > 0.05$ ,  $t = -0.348$ ); there was a significant difference in the bilateral upper extremity reach differences among different projects. Among HIPHOP dancers ( $P = 0.006$ ,  $P < 0.05$ ,  $t = 3.451$ ); among jazz dancers ( $P = 0.000$ ,  $P < 0.05$ ,  $t = 5.099$ ); among breakdance dancers ( $P = 0.001$ ,  $P < 0.05$ ,  $t = 4.27$ ). There was a significant difference in the bilateral lower extremity reach differences among different projects. Among HIPHOP dancers ( $P = 0.000$ ,  $P < 0.05$ ,  $t = 7.957$ ); among jazz dancers ( $P = 0.0000$ ,  $P < 0.05$ ,  $t = 6.452$ ); among breakdance dancers ( $P = 0.000$ ,  $P < 0.05$ ,  $t = 7.055$ ). According to the analysis of YBT symmetry test results, in the left-right symmetry movement test, at least half of the street dance enthusiasts showed asymmetry. The reason is also due to the special movement patterns of dance. In long-term training, the dominant side is developed, resulting in unbalanced muscle strength on both sides of the body and the overall movement chain being disrupted. This makes street dance enthusiasts prone to movement compensation when performing some performance movements, and the risk of injury increases. Therefore, future training should focus on the development of bilateral symmetry of the body, taking into account the training on both sides of the body, making both sides develop evenly and reducing the risk of sports injuries.

**Key Words:** Functional motion screening, Y balance test, Hip hop sports injury, Sports injury risk

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**Is it appropriate to group the peroneus muscles (peroneus longus and peroneus brevis) together as the peroneus muscles?**

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The peroneus muscles, consisting of the peroneus longus and peroneus brevis, have a main eversion ankle joint action and are important in preventing lateral ankle sprains. Recent studies show peroneus longus and peroneus brevis have different actions: peroneus longus acts ankle eversion, while peroneus brevis abducts the foot and ankle joint. Although general ankle eversion training, grouped together with the peroneal muscles, is recommended for preventing lateral ankle sprain, is it the right approach? This study tested specific training for each muscle to explore these differences. Participants were divided into peroneus longus training ( $n=9$ , push the TheraBand [Black] out from the ball of the foot) and peroneus brevis training ( $n=9$ , pull the same TheraBand with ankle external rotation) group. Two

sets of 100 times (about 7 minutes) were done 3 times a week for 8 weeks, the intensity was unified to be at least 8 in the visual analogue scale. Each muscle cross-sectional area was measured by ultrasound system. Strength of each muscle was measured by handheld dynamometer. Measurements were taken before and immediately after the intervention, at 10, 20, and 30 minutes during the first week, and the first day of the week following each weekly task. Two-way ANOVA was used for analysis. Only in the peroneus longus training group, a temporary increase (muscle swelling) and a sustained increase (muscle hypertrophy) in the muscle cross-sectional area of the peroneus longus were observed, while a temporary decrease in muscle strength was observed but a sustained increase. Similar trends in peroneus brevis were also observed in just the peroneus brevis training group. The results of this study emphasize that the actions of the peroneus longus and peroneus brevis are inherently separate. Although previous training has targeted the grouped peroneal muscles, it is essential to approach peroneus longus and peroneus brevis as fundamentally distinct muscles.

**Key Words:** Autonomic function, diurnal timing, exercise, high-intensity interval training

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### The Advance of Research on Artistic Gymnastics

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A great deal of scholarly work has been conducted on artistic gymnastics. As far as we know, no study has been conducted to sort and summarize the current literature on artistic gymnastics. The goal of this study is to provide a comprehensive review of the existing literature on this event. We conducted a literature search of the PubMed, Web of Science, Scopus, and ProQuest Library databases using the keywords "artistic gymnastics, athletes, competition, training, injury, and rehabilitation". A total of 2319 papers were retrieved, of which 41 were selected for further analysis. Result: (1) Studies in artistic gymnastics have been conducted from three perspectives: training and physical fitness, nutrition and metabolism, as well as sports injury and rehabilitation. (2) Core fitness training can have a direct impact on the performance level of artistic gymnasts in competition. (3) Gymnasts often experience a lack of adequate nutrition. (4) Injury rate of artistic gymnastics is three times higher than their peers, necessitating early prevention. Conclusion: (1) In sports training, the inclusion of core fitness training, strength training, and resistance and whole-body vibration training in daily training can improve the competitive performance of artistic gymnasts. (2) In sports nutrition and metabolism, nutritional intake and dietary habits of artistic gymnasts need to be managed to avoid nutritional imbalances and metabolic disorders in athletes. (3) In sports injury and rehabilitation, artistic gymnasts, particularly elite athletes, are prone to a high rate of injuries. Tendinitis, back pain, and sprains are the principal kinds of injuries. The most common form of injury is an ankle sprain, which is typically caused

by overtraining, and there is a lack of research on the prevention and rehabilitation of injuries in artistic gymnasts.

**Key Words:** Artistic gymnastics, Training and Physical Fitness, Sports Injuries, Nutrition and Metabolism

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### Effects Of 3D Printed Lattice Structure Insoles Vs Solid Structure Insoles In Badminton Players With Achilles Tendinopathy

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Achilles tendinopathy is one of the most common overuse injuries in badminton players due to the high impact and repetitive strain on the Achilles tendon. The use of orthotic insoles is a prevalent intervention to mitigate pain and enhance function. Recent advancements in 3D printing technology have enabled the creation of lattice-structured insoles, which may offer distinct advantages over traditional solid-structured insoles. Insoles with lattice-structured cells allow for customised footbed stiffness and flexibility. This structure improves stress absorption and energy regeneration for high-impact sports like badminton. Research shows lattice arrangements increase material utilisation, resulting in lighter, more supportive and durable insoles. This study evaluates the effects of lattice-structured 3D-printed insoles compared to solid-structured insoles, specifically in badminton players with Achilles tendinopathy. A pilot of 10 badminton players were recruited and baseline data was obtained. We gave all of the subjects a pair of custom-made 3D-printed lattice structure insoles (LS) and solid structure insoles (SS) for one week each, with a week of resting period in between. Before and after using both insoles, we asked the subjects to mark their comfort level on an orthotic comfort index (OCI) and visual analog score (VAS). Data was collected in Excel and was processed in Jamovi Version 2.5.3.0. Paired t-test of individual insole was significant (SS: p-value: 0.036; LS: p-value: 0.001) with OCI score favouring LS, while VAS showed significant improvement with both the insoles. Repeated measures ANOVA analysis showed significant OCI difference between the groups (p value: 0.03) but no significant difference between the groups in VAS scores. This allows us to investigate the effects of lattice-structured insoles on badminton players with Achilles tendinopathy in a larger population and determine the long-term effects.

**Keywords:** 3D printed insoles, Lattice structure insoles, Solid structure insoles, Badminton players, Achilles tendinopathy

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## Predicting Performance in Badminton Based on ACTN3 R/X and BDNF Val66Met Gene Polymorphisms

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This study investigates whether ACTN3 R/X and BDNF Val66Met gene polymorphisms may serve as predictors of success performance of badminton players. Methods: ACTN3 R/X and BDNF Val66Met genotypes were assessed using DNA samples collected by buccal cells from 101 well-trained male badminton players aged  $20.72 \pm 6.72$  years old. To assess injury rate and severity, descriptive data on the athlete's training and injury history in the past year was obtained. Simple and choice reaction time tests assessed cognitive motor skills in athletes. To assess athletes' strength and power, handgrip, leg, vertical jump, standing long jump, and 40-meter sprint tests were employed. Data was analysed using Spearman and Pearson correlation, multinomial logistic regression, Chi-Square, and one-way ANOVA. Result: ACTN3 R/X positively correlates with athlete back strength ( $r_s = 0.283$ ,  $p < 0.05$ ) and handgrip strength ( $r_s = 0.320$ ,  $p < 0.05$ ). There was a favorable link between BDNF Val66Met gene polymorphism and both simple and choice reaction times ( $r_s = 0.230$ ,  $p < 0.05$ ). Stronger back and handgrip strength ( $b = 0.024$ ,  $p = 0.031$  and  $b = 0.138$ ,  $p = 0.007$ ) are associated with the RR genotype rather than the XX genotype. The data also imply that athletes with faster simple and choice reaction times have a BDNF ValVal genotype rather than a MetMet variant. Conclusions: This study shows that the ACTN3 R/X and BDNF Val66Met genetic variants can predict badminton player performance, potentially leading to more effective and efficient performance enhancement measures.

**Keywords:** Badminton performance; ACTN3 R/X polymorphism; BDNF Val66Met polymorphism; Genetic prediction; Athlete performance

## The Immediate Effect of Aqua Bag Exercises on Postural Sway in University Students

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**Purpose:** The purpose of this research is to explore the effects of aqua bags on dynamic balance in university students. **Methods:** Twelve university students with an average age of  $21.75 \pm 1.91$  years participated in this study, and every participant was to intervene in three short-time treatments, including aqua bag weight-shifting training, medicine ball weight-shifting training, and 3 sets of aqua bag exercise, to compare the

effects between the aqua bag and medicine ball, and the effects before and after an aqua bag exercise. The Y-Balance Test (YBT) assessed dynamic balance before and after the intervention. Data were analyzed using descriptive statistics, paired sample t-tests, and repeated measures ANOVA. Results: The study found that the aqua bag had a positive impact on the YBT dynamic balance test. Specifically, in the weight-shifting training, the right anterior, left anterior, left posterolateral, and left posteromedial were statistically significant ( $p = .000 < .05$ ), and also better than those with the medicine ball and pre-test results. After the intervention of aqua bag exercises, the post-test scores were significantly better than the pre-test scores. Conclusion: This study provides evidence of the immediate effects of aqua bags on dynamic balance. Establishing the pathways through which influences balance requires further investigation. The study recommended that future studies increase the duration and number of test items to explore the effects and factors influencing Motor control abilities with an aqua bag.

**Keywords:** Y-balance, Water Bag, Medicine Ball, Motor control

## EXERCISE SCIENCE

### Bibliometric Analysis on bodybuilding

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This study provides a comprehensive bibliometric analysis of scientific research in bodybuilding using the Web of Science database. It aims to identify research trends, high-producing authors and influential journals, collaboration networks, and research hotspots. The findings will clarify future research directions and advance the field. Data was extracted and analyzed using the Bibliometrix R package. A total of 940 publications from 1976 to 2024 were screened. Key bibliometric indicators such as annual scientific output, average citations per year, and author productivity were calculated. The analysis included publication trends, citation analysis, co-authorship networks, collaborative author networks, and keyword co-occurrence. The study reveals a continuous growth trend in bodybuilding research, with an annual growth rate of 8.49%. Significant contributions came from the United States, Brazil, and the United Kingdom. UNIV SYDNEY, UNIV SAO PAULO, and AARHUS UNIV were the most prolific institutions. The document's average age was 9.17 years, indicating a slower update rate in body-building research. The average citation count per article was 16.44. Key topics identified include exercise and strength training, body composition changes, health impacts, weight loss, and drug abuse, with increasing interest in recent years. International collaboration is prevalent, facilitating communication across countries, institutions, and authors. The keyword co-occurrence network identified three main clusters: health and abuse, exercise and body composition, and body image and psychology, which guide future research directions. The bibliometric analysis provides a detailed overview of

bodybuilding research, highlighting its growth and diverse topics. It underscores the importance of international collaboration and identifies emerging trends, offering valuable insights for future research. Future studies should address the gaps identified in the literature, especially in mental health and anabolic steroids.

**Key Words:** Bodybuilding, Bibliometric analysis, Research trends, Collaboration networks

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Abstract ID: OP-ES0139

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### Innovations in Rowing Ergometer Training for Enhancing Fitness and Performance: A Narrative Review

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attracted widespread attention for its effectiveness in improving basic physical fitness and performance, as well as enhancing the physical fitness of the general population. At present, rowing ergometer training has been widely used in many high-level sports teams and gyms. However, there is limited research available on the underlying mechanism of rowing ergometer training. This study aims to explore the advancements and the impacts of rowing ergometer training on enhancing both basic physical fitness and specific athletic performance, using the narrative review approach. A narrative review was conducted systematically, analysing literature regarding application effect, mechanism of action, influencing factors, intervention research related to rowing ergometer training. The results indicated, 1) The mechanism of action for rowing ergometer training may be influenced by personalised adaptive resistance, stretch-shortening cycle (SSC), and nervous system mobilisation. 2) Acute rowing ergometer training effectively recruits and mobilises muscle activity, inducing the activation of the post-activation potentiation (PAP) effect; 3) Rowing ergometer training enhances sports performance parameters such as muscle size, strength, and agility in changing direction. Combining rowing ergometer training with aerobic training promotes improved adaptation in cardiovascular and skeletal muscle systems. In conclusion, rowing ergometer training demonstrated significant benefits in improving basic physical fitness, specific physical fitness and general health indicators. Future research should further explore changes in training load, duration and methodologies to optimise training effects while minimising fatigue and the risk of injury.

**Key Words:** Rowing Ergometer, Performance Enhancement, Application Strategies, Training Effects, Basic Physical Fitness

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Abstract ID: OP-ES163

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### Association Between Sprinting Performance and Lateral Change of Direction Ability in Elite Badminton Doubles Players

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Understanding the determinants of lateral change of direction (COD) ability is crucial for doubles badminton players. Previous research has shown a strong correlation between sprinting ability over various distances and COD ability in basketball players. Therefore, this study aims to investigate whether the same trend is observed in doubles badminton players. This study investigated the connection between sprinting speed (at 0-5, 0-10, and 0-20 meters) and agility (measured by side-to-side COD test) in 25 national badminton players (15 Females: 20.0 ± 3.6 years, 57.8 ± 4.4 kg; 161.8 ± 4.5 cm; 10 males: 21.2 ± 4.1 years, 70.8 ± 9.0 kg; 171.9 ± 5.8 cm). A timing gate was used to record performance data and statistical analyses to determine the relationship between these factors. The results of different sprint distances and COD are as follows (15 Females: 1.17 ± 0.06s, 1.98 ± 0.09s and 3.42 ± 0.14s; 10 males: 1.06 ± 0.05s, 1.78 ± 0.06s and 3.05 ± 0.09s), (15 Females: 6.04 ± 0.26s; 10 males: 5.66 ± 0.18s). There was a strong correlation between lateral COD and different sprint distances: 0-5m, 5-10m and 10-20m (r=0.78, 0.82 and 0.89, p<0.01) on female and male players (r=0.74, 0.80 and 0.87, p<0.01). Later phases of sprinting (10-20 m) showed a very high correlation with lateral COD ability, and the same trend was found in both genders. The results can be explained because 0–5 m requires more concentric and lesser stretch-shortening cycle (SSC) demand, but when the distance builds up, it starts to rely more on SSC ability, while lateral COD requires a high amount of SSC ability. In conclusion, our findings suggested that coaches can implement longer distance sprinting to enhance lateral COD ability.

**Key Words:** Sprinting, COD, Speed, SSC

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Abstract ID: OP-ES237

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### The short term health benefits of AirBadminton: a case-control study

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Cardiovascular disease (CVD) accounts for 31% of all deaths worldwide. This pattern is even going to be worse after Covid era. Physical inactivity and sedentary behaviors are significantly associated with CVD and CVD risk factors. About 80 percent of all-cause mortality of CVDs are preventable. Badminton with the introduction of Air-Badminton and Para-Badminton is one of the most popular sports all around the world. AirBadminton with involvement of cardiovascular and musculoskeletal has so many potential health benefits. Beside the social distance also is included in this sport. But the strength of evidence and research in this area is low. The aim of this study is to show the health benefit of AirBadminton for general population health promotion

even in quarantine situations. In this study we evaluated 40 apparently healthy people with 6 weeks Air-Badminton playing 3 times a week and 30 minutes each time in comparison to 40 cases with sedentary behaviors. Fasting blood samples were obtained and plasma glucose, C-Reactive protein (CRP), vitamin D level and lipid profile were measured. The remaining electrocardiogram (ECG) and Echocardiography were obtained. The significantly higher level of HDL was found in the AirBadminton group. The FBS was significantly lower in the exercise group. The lower Cholesterol and LDL level were lower in the exercise group but it was not statistically significant. Heart rate and systolic blood pressure were lower in the case group. Diastolic function was better in the exercise group. In conclusion, six weeks of AirBadminton exercise with high adherence to exercise could be a very good solution for a big problem i.e. cardiovascular disease. Lower heart rate, lower systolic blood pressure and better diastolic function are at least benefits of AirBADminton. Other benefits could be measured in long term follow up with larger sample size.

**Key Words:** AirBadminton; Cardiovascular Disease; Covid Era

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### Effects of Sugared Drinks on Performance during Anaerobic Sprint Test and Other Physiological Measures

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To investigate the effects of consuming Coca-Cola on athletic performance during high intensity anaerobic sprint performance and other physiological measures. Nine healthy female adults (age:  $22.1 \pm 1.10$ , height:  $160.50 \pm 5.21$  cm, weight:  $53.42 \pm 8.18$  kg, body fat:  $26.43 \pm 5.95$  %, body mass index (BMI):  $20.66 \pm 2.42$  kg·m<sup>-2</sup>) participated in a randomised single-blinded experimental study over two sessions. Participants' anthropometric measurements were taken prior to the first testing. Each session involved participants consuming either 300 ml of Coca-Cola (CC) or Coca-Cola Zero Sugar (CCZS) as the placebo. Following 1.5 hours of ingestion, participants underwent the Running-Based Anaerobic Sprint Test (RAST). RAST comprised one set of six 35-meter sprints with 10-second recovery intervals, followed by a second set after a 4-minute rest period. OMNI Rate of Perceived Exertion (RPE), heart rate (HR), and total effort time (TET) were recorded. Power output (PO) and fatigue index (FI) relative to body mass were calculated. Peak power output (PPO), velocity, and TET were calculated using sprint timings and body mass. There were significant results between 2nd RAST of CC and CCZS for FI (CC:  $27.82 \pm 11.53$  % vs. CCZS:  $36.82 \pm 11.90$  %,  $p < 0.001$ ); HR (2nd RAST CC:  $157.47 \pm 11.14$  beats·min<sup>-1</sup> vs. CCZS:  $160.47 \pm 9.85$  beats·min<sup>-1</sup>,  $p = 0.041$ ); RPE (CC:  $4.94 \pm 0.69$  vs. CCZS:  $5.11 \pm 0.65$ ,  $p = 0.011$ ). No significant difference was observed in TET and PO between CC and CCZS conditions. This study concluded that sugared drinks reduced FI, produced lower RPE and HR. There was also an increase in PO of each run but no significant change

for overall PO. Athletes engaging in anaerobic activity can potentially incorporate sugared drinks as pre-exercise nutrition for enhanced athletic performance. More research could provide more comprehensive insights into the practical applications of CC during sports and exercise settings.

**Key Words:** Coca-Cola, ergogenic aid, total effort time, power output, rate of perceived exertion

## Poster Presentation

Abstract ID: SM116

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### A study of the effect of 24-posture tai chi training on blood factor vitamin D in Chinese community MCI elders

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Tai chi exercise is one of the treasures of Chinese culture, and has become an important vehicle for spreading traditional Chinese national sports with its simple and clear movement design. The aim of this study is to investigate the effect of 24-step tai chi training on blood factor vitamin D in Chinese community MCI elderly, and then maximize the improvement and delay the incidence of AD. This study used the experimental method, documentation method, and mathematical statistics method to study the effect of twenty-four-posture tai chi training on the blood factor vitamin D of MCI elderly people through a random control group experiment, in which 65-75-year-old MCI elderly people (n=53) in a community in Chengdu City, China, underwent twenty-four-posture tai chi training for a period of six months. The experimental group (n=31) conducted twenty-four-steps tai chi training, and the control group (n=22) only conducted community health education presentations. The data were analyzed using SPSS 27.0 statistical software package. Results: (1) Comparison of vitamin D before and after 6-month intervention, the experimental group has a significant difference ( $p < 0.01$ ), and the control group has no difference ( $p > 0.05$ ). (2) Before and after the intervention, there was no correlation between vitamin D and FMI levels in the two groups ( $r = 0.43$ ,  $p > 0.05$ ); after the intervention, there was a significant positive correlation between vitamin D and BW in the experimental group ( $r = 0.86$ ,  $p < 0.05$ ); there was no correlation between vitamin D and BW in the control group ( $r = 0.56$ ,  $p > 0.05$ ). 6 months of twenty-four-step tai chi training can significantly increase the level of vitamin D in elderly people with MCI, which better promotes the synthesis and release of neurotransmitters, thus regulating the growth and differentiation of neurons. It suggests that maintaining adequate vitamin D levels can contribute to the enhancement of cognitive function in the elderly.

**Key Words:** 24 posture tai chi training, mild cognitive impairment, vitamin D

**A study of the effect of 6 months of resistance training on body composition indicators in a population with sarcopenia**

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Resistance training is a physical activity that produces skeletal muscle contraction through the use of external resistance. This type of training has been shown to be effective in the prevention and management of sarcopenia, as well as in improving muscle strength, endurance, and physical activity performance capacity in older adults. The aim of this study was to investigate the effect of 6 months of resistance training on body composition indices in a population with sarcopenia, which in turn is effective in preventing and improving muscle strength and somatic function in older adults. This study used experimental, documentary, and mathematical statistical methods to conduct a 6-month intervention by RCT in a community of Xi'an, China, with a population of sarcopenia aged 65-75 years (n=71). The experimental protocol used progressive load progression, with the experimental group (n=41) performing resistance training and the control group (n=30) only conducting community health education presentations. The pre- and post-experimental data were analyzed using SPSS27.0 statistical software. Results: (1) After 6 months of experiment, the levels of BMI, SMM, and SMI in both groups showed a decreasing trend, but it was not significant ( $p>0.05$ ); in the comparative analysis between groups, the levels of BMI, SMM, and SMI in the experimental group were higher than those in the control group ( $p<0.05$ ). (2) Comparison between the two groups of female elderly FMI levels before and after and between the groups showed significant differences ( $p<0.05$ ). In comparison with males, the comparison of FMI levels between the two groups after the experiment has a highly significant difference ( $p<0.01$ ); the experimental group FMI levels before and after the intervention has a significant difference ( $p<0.05$ ). Six-month resistance training has a significant effect on BMI, SMI, and SMM levels in people with sarcopenia. Resistance training can stimulate the growth of skeletal muscle mass as well as content in sarcopenic people, thus improving body composition as well as quality of life in sarcopenic people.

**Key Words:** Resistance Training, People with sarcopenia, body composition

**A survey of knowledge and attitudes regarding concussion among university men's lacrosse players**

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The purpose of this study was to conduct a survey of knowledge and attitudes regarding concussion among university male lacrosse players. The target group consisted of 102 players belonging to university men's lacrosse clubs affiliated to the Japan Lacrosse Association. (1 school in the Kanto region, 4 schools in the Kyushu region) (15 freshmans, 32 sophomores, 31 juniors, 24 seniors) (22 attackers (AT), 39 midfielders(MD), 31 defenders(DF), 13 face-offers(FO), 9 goalies(G)) Paper questionnaires were distributed at each university men's lacrosse club activity venue and completed on site. Paper questionnaires were distributed at each university men's lacrosse club activity location and filled in and collected on the spot. Twenty-five minutes were given to complete the questionnaires and 15 minutes to explain the survey, distribute and collect them. The questionnaires used were the Concussion History Questionnaire and the Rosenbaum Concussion Knowledge and Attitudes Survey-Student Version (RoCKAS-ST), a concussion knowledge and attitudes questionnaire. The Concussion History Questionnaire provides basic information about the individual and the sport and the athlete's concussion history, including years of concussion experience, whether the injury was caused by concussion, time of injury, mechanism of injury, diagnosis, symptoms and time taken to return to play The RoCKAS-ST assesses concussion knowledge and attitudes A 55-item questionnaire that assesses knowledge and attitudes towards concussion, with higher scores indicating greater knowledge and safer attitudes. Descriptive statistics (mean and standard deviations) were calculated using Excel (Version 16.87) and SPSS Verison28 (IBM, Chicago, Illinois, USA) was used to calculate Pearson's correlation coefficient and Spearman's rank correlation coefficient. The Kruskal-Wallis test was used to calculate whether there were significant differences in the knowledge and trend indices by grade and position. For all statistics, the alpha level was set at  $p<0.05$ . The overall results showed that the knowledge index was  $18.0 \pm 3.4$  out of 25 points and the attitude index was  $65.3 \pm 9.4$  out of 75 points. By grade level, the knowledge index was  $17.2 \pm 3.9$  points for freshman,  $17.5 \pm 3.8$  points for sophomore,  $19.0 \pm 2.2$  points for junior and  $18.1 \pm 3.5$  points for senior. The attitude index was  $66.7 \pm 8.4$  points for freshman,  $62.1 \pm 12.1$  points for sophomore,  $67.4 \pm 7.0$  points for junior and  $65.8 \pm 7.9$  for senior. By position, the knowledge index was  $17.7 \pm 4.1$  points for AT,  $17.8 \pm 3.1$  points for MD,  $17.3 \pm 4.2$  points for FO,  $18.5 \pm 3.2$  points for DF and  $19.4 \pm 2.6$  points for G. The attitude index was  $65.0 \pm 10.6$  points for AT,  $62.6 \pm 10.5$  points for MD,  $67.8 \pm 5.2$  points for FO,  $66.1 \pm 8.7$  points for DF and  $69.8 \pm 3.1$  points for G. By grade level, significant differences were found between sophomore and junior in the trend index. By position, no significant differences were found in the knowledge and attitude indices. The overall knowledge index in lacrosse competition was  $18.0 \pm 3.3$  points and the attitude index was  $65.3 \pm 9.4$  points. Compared to other sports in the previous study, the trend attitude was higher. Although, there were no significant differences in the concussion knowledge index or attitude index by position, there were significant differences between sophomore and junior players by year group.

**Key Words:** concussion, lacrosse, knowledge, attitudes



Abstract ID: SM164

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## EFFECT OF HIGH INTENSITY INTERVAL TRAINING ON PATIENTS WITH TYPE 2 DIABETES MELLITUS

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According to the official IDF website, about 540 million people worldwide have diabetes. About 10.5% of the adult population (aged 20-79 years) have diabetes with some not knowing they are living with the condition (The IDF Diabetes Atlas, 2021). The prevalence of death caused by Type 2 Diabetes Mellitus is 32.6% in patients under 60 years of age out of a mortality rate of 6.7 million. This research was conducted to evaluate the effectiveness of High Intensity as an intervention for patients with Type 2 Diabetes Mellitus. Methods that this research used were based on two online databases: Pubmed and ScienceDirect. Selection of suitable articles was based on title, abstract, content and reading the article in its entirety. Critical review of the selected articles was conducted using the Oxford critical appraisal worksheets. After concluding and excluding articles found from the two online databases, the literature search yielded 5 studies that were used to test the effectiveness of High Intensity Interval Training compared to other exercises. Some of the aspects that were considered were VO2 Max and HbA1c which greatly influenced the performance of the participants. This research concludes that doing High Intensity Interval Training consistently with the exercises provided can affect the condition of patients who initially have an ideal body composition to be better. Their Tolerance to High Intensity Training is higher because the workload given is greater.

**Key Words:** Hb1A1C, high intensity interval training, moderate intensity continuous training, type-2 diabetes mellitus, VO2 max

Abstract ID: SM189

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## Exploring the Application of an Artificial Intelligence-Based Postural Analysis Training System in Exercise Rehabilitation for Stroke Patients

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This paper investigates the feasibility of a contactless artificial intelligence-based somatosensory analysis training system for aiding exercise rehabilitation in stroke patients. The system's hardware includes a depth camera that captures real-time color images and distance data. The software employs a modified CSPNext backbone network combined with residual log-likelihood estimation loss to obtain real-time 2D posture information of stroke patients during movement. The system includes evaluation of 63 different movements, it analyzes various body parts, including the head, shoulders, hips, knees, ankles, spine, and center of gravity. It detects angles, angular velocities, and angular accelerations of these parts in real time

and generates visualizations and quantitative analysis reports. These reports provide physiotherapists with evidence to analyze specific muscular weaknesses and tension levels, thereby facilitating the formulation of more precise rehabilitation programs. The clinical trial involved 30 stroke patients. The control group and the experimental group each comprised 15 patients. The patient's movements, including sitting, standing, walking, and going up and down stairs, were analyzed. The experimental group used the proposed system for movement index measurement, while the control group utilized hardware sensors. The experimental results indicate that the posture detection algorithm achieved an Average Precision of 72.4% and 88.9% accuracy of Average Precision at IoU=0.5, with an average motion index measurement error of 4.3%. The proposed artificial intelligence-based posture analysis training system demonstrates good accuracy, achieves completely contactless measurement, and is feasible for application in stroke patient rehabilitation.

**Key Words:** Stroke, Postural analysis, Exercise rehabilitation

Abstract ID: SP018

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## The Influence and Mechanism of Anxiety on the Performance of Novice Golf Players

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In the competitive sports environment, state anxiety is a common phenomenon. There are many theories explaining how anxiety affects exercise performance from different perspectives, one of the hypotheses is that anxiety interferes with the inhibitory function of the central executive system. For golfers, the inhibitory function plays a key role. So, is the mechanism by which anxiety affects motor performance due to changes in inhibitory function? This study focuses on novice golfers and uses a golf simulator to explore the mechanism by which anxiety affects sports performance. First, we triggered the high state anxiety of the subjects by setting the stress scenario. Secondly, the present study used the E-prime2.0 technique to design the antisaccade task to measure the inhibitory function of the subjects. Again, use the Hanaro screen golf 3S simulator to measure the hitting level of the golf. After the anxiety situations is activated, the anxiety level of athletes significantly increases,  $t=-2.658$ ,  $p<0.05$ , Cohen's  $d=0.448$ , and their golf hitting performance also significantly decreases,  $t=2.603$ ,  $p<0.05$ , Cohen's  $d=0.295$ . There are significant differences in anxiety levels and athletic performance among athletes before and after the initiation of stress situations, but there is no significant change in their inhibitory function. The increase of anxiety level suppresses the performance of golf novices, but the mechanism still needs further exploration.

**Key Words:** Anxiety, Inhibition function, Sports performance, Antisaccade

Abstract ID: SP020

### The effects of Chinese coaches' coaching styles on athletes' training engagement: the mediating role of situational motivation

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To strengthen training strategies and improve athletic performance, this study explored the influencing mechanism of athletes' training investment. By constructing a mediating model from the perspective of situational motivation, we investigated how coaching styles shape athletes' motivation and subsequently affect their training investment. Methods: A questionnaire survey was conducted among athletes from sports teams in Guangdong Province, and data were analyzed using SPSS 25.0 and Mplus 8.0. Results: (1) In the relationship between coaching style and situational motivation, an autonomous supportive coaching style significantly and positively predicted the intrinsic motivation and identified regulation of situational motivation ( $\beta=0.779$ ,  $p<.001$  and  $\beta=0.521$ ,  $p<.001$ , respectively), while significantly negatively predicting external regulation ( $\beta=-0.236$ ,  $p<.001$ ) and amotivation ( $\beta=-0.291$ ,  $p<.001$ ). A controlling coaching style negatively predicted intrinsic motivation ( $\beta=-0.663$ ,  $p<.001$ ) and identified regulation ( $\beta=-0.437$ ,  $p<.001$ ), while positively predicting external regulation ( $\beta=0.188$ ,  $p<.001$ ) and amotivation ( $\beta=0.330$ ,  $p<.001$ ). A benevolent coaching style positively predicted intrinsic motivation ( $\beta=0.812$ ,  $p<.001$ ) and introjected regulation ( $\beta=0.584$ ,  $p<.001$ ), and negatively predicted external regulation ( $\beta=-0.287$ ,  $p<.001$ ) and amotivation ( $\beta=-0.229$ ,  $p<.001$ ). (2) Regarding the relationship between coaching style and training engagement, autonomous support ( $\beta=.117$ ,  $p<.001$ ) and controlling ( $\beta=-.089$ ,  $p<.005$ ) coaching styles could predict training participation. A benevolent coaching style could not directly predict training participation ( $\beta=.077$ ,  $p>.05$ ). (3) In the relationship between situational motivation and training engagement, identified regulation ( $\beta=.163$ ,  $p<.001$ ) and integrated regulation ( $\beta=.096$ ,  $p<.005$ ) positively predicted training engagement, while external regulation ( $\beta=-.117$ ,  $p<.005$ ) and amotivation ( $\beta=-.082$ ,  $p<.001$ ) negatively predicted training engagement. (4) Based on the above data, situational motivation played a full mediating role in the relationship between a benevolent coaching style and training participation. Additionally, situational motivation played a partial mediating role in the relationship between an autonomous supportive coaching style and training engagement (mediation effect size: 67.58%), and in the relationship between a controlling coaching style and training engagement (71.76%). In summary, autonomous supportive and benevolent coaching styles help to improve athletes' intrinsic motivation and training engagement, while a controlling coaching style may have a negative impact on them. Situational motivation is a mediating variable in the relationship between the three coaching styles and athletes' training engagement.

**Key Words:** training engagement, coaching styles, situational motivation, autonomy supportive, benevolent coaching styles

Abstract ID: SP022

### Autonomy Support and Sport Engagement Interactions: An Analysis Based on Latent Variable Growth Modeling

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In the exercise scenario, whether there is a two-way relationship between autonomous support and athletic engagement has not been empirically examined. The purpose of this study is to elucidate the causal relationship between autonomic support and athletic engagement by investigating the establishment of a bidirectional relationship between the two. In this study, 79 provincial team athletes were tracked for 6 months at 3 time points from the beginning of the season to the middle of the season and then to the end of the season, with each measurement interval of 3 months. The Athlete Engagement Questionnaire was used to evaluate the athletes' degree of sports involvement in training, and Perceived Autonomy Support scale was used to evaluate the athletes' perceived degree of coach autonomy support. Latent growth modeling (LGM) was constructed to examine the development trajectory of autonomic support and athletic engagement, as well as the causal relationship between them. Results: 1) Results from the unconditional latent growth model showed a linear downward trend in the levels of athletic engagement and perceived autonomous support across the three measured periods ( $p<0.001$ ). 2) The results of cross-lag regression analysis showed that compared with other competing models, the cross-lag full model fitting data between athletic engagement and perceived autonomous support reached acceptable standards,  $X^2/df=2.462$ ,  $CFI=0.995$ ,  $GFI=0.982$ ,  $SRMR=0.001$ ,  $RMSEA=0.000$ . In the model, both T1 time and T2 time autonomic support can significantly predict the athletic engagement at the next time point. Athletic engagement at T2 time significantly predicted autonomous support at T3 time ( $\beta=0.591$ ,  $SE=0.024$ ,  $p<0.001$ ), but the influence of athletic engagement at T1 on T2 autonomy support was not significant ( $\beta=0.094$ ,  $SE=0.091$ ,  $p=0.302$ ). In the competitive sports environment, there is a dynamic interaction between athletic engagement and perceived autonomous support. The influence between the two is mutual, but the influence of autonomous support on athletic engagement is more stable than that of athletic engagement on autonomous support.

**Key Words:** Autonomic function, diurnal timing, exercise, high-intensity interval training

Abstract ID: SP045

### Pre-exposure Postural Precursors of Motion Sickness in Head-Mounted Displays: Comparing Head and Hand Control Modes

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This study explored the relationship between pre-exposure body sway and the incidence of motion sickness in different control modes in a virtual reality head-mounted display (HMD). Twenty males ( $21.32 \pm 1.69$  years) and 20 females ( $21.95 \pm 3.39$  years) were recruited as participants. Before exposure to a virtual reality HMD, participants were required to stand and perform two simple visual tasks (inspection and search). They then wear the HMD and play a space simulation game (EVERSPACETM) in a seated position under either head control or hand control mode for up to 20 minutes. A magnetic motion tracking system (Flock of Birds) was used to collect their head and torso displacements in the anterior-posterior (AP) and mediolateral (ML) axes. The incidence of motion sickness was determined based on participants' responses to a dichotomy question (are you motion sick? yes/no). The incidence of motion sickness was not significant different ( $\chi^2 = 0.476$ ,  $p > .05$ ) between the head control group (25%) and the hand control group(35%). In terms of postural control, an analysis of variance on Motion Sickness by Task by Control Mode indicated a significant Motion Sickness by Task effect ( $p = .03$ ) in the AP axis of Head movement. Also, the Task by Control Mode effect was significant ( $p < .05$ ) at the AP axis of the head and torso movements. These results showed that postural precursors of motion sickness differed as a function of visual task and the influences of visual task on postural control depended on control mode and vice versa in a virtual reality environment. These findings contribute to understanding the causes of motion sickness in virtual reality environments and serve as a foundation for creating more comfortable virtual reality experiences.

**Key Words:** Motion Sickness, Head Mounted Displays, Virtual environment, Body Sway

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Abstract ID: SP046

### Effects of Different Frequency of Visually-guided Eye Movement on body sway and head-eye coordination

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This study investigated the effects of different visually-guided eye movement frequencies on body sway and head-eye coordination. Sixteen male ( $20.63 \pm 1.38$  years) and sixteen female ( $21.42 \pm 1.95$  years) healthy young adults participated. Participants' body movements during quiet standing were compared between visually-guided fixation of a fixed target and 0.2Hz, 0.5Hz, and 1.1Hz horizontal eye movement). An eye tracking system (Tobii Pro Nano) was used to record fixation time and fixation duration of participants' eye movements and a magnetic motion tracking system (Flock of Birds) was used to record their head and torso displacements in the anterior-posterior (AP) mediolateral (ML) axes. The results showed that during visually-guided fixation of a fixed target, participants exhibited fewer number of fixation time and longer fixation duration. Faster visual target frequencies elicited more number of fixation time and shorter fixation duration. For body sway,

head and trunk AP sway was significantly greater during visually-guided fixation of a fixed target compared to 0.2Hz, 0.5Hz, and 1.1Hz horizontal eye movement. No significant correlations were observed between eye and head movement parameters. This study found that visually-guided horizontal eye movements affected the number of fixation time and duration of eye movements and body sway, but did not affect head-eye movement coordination, the results supported the functional integration hypothesis of postural control.

**Key Words:** eye movement, postural control, fixation, visually-guided eye movement, head-eye coordination

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Abstract ID: SP088

### The Impact of Community Sports Environment and Peer Support on Physical Activity Among Overweight and Obese Children Aged 12-15 in China

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This study aims to investigate the impact of Community-sport' environment and Peer support on physical activity among overweight and obese children aged 12-15 in China. Additionally, it explores the mediating effect of peer support factors. The study utilized the Community-Sport' environment Scale, Peer Support Scale and the IPAQ - Short version to survey 246 overweight and obese children aged 12-15. The sample included 131 boys (53.25%) and 115 girls (46.75%), with an average BMI of  $24.7 \pm 2.3$  kg/m<sup>2</sup>. Community-sport' environment, peer support ( $r = 0.472$ ) was significantly and positively associated ( $p = 0.003$ ) with physical activity ( $r = 0.324$ ) in overweight and obese children. Peer support was significantly and positively associated with physical activity in overweight and obese children ( $r = 0.221$ ,  $p = 0.009$ ). Gender, Community-sport' environment, and peer support all have significant effects on the differences in physical activity among overweight and obese children ( $p = 0.001$ ). However, age does not significantly impact the physical activity of these children ( $p = 0.08$ ). Peer support mediates the relationship between the Community-sport' environment and physical activity among obese children, with a mediation effect size of 32.21%. Physical activity levels are higher in overweight and obese boys compared to girls, with no significant differences observed across age groups. The Community-sport' environment and peer support are key motivators in promoting physical activity among obese children. The Community-sport' environment not only directly encourages physical activity but also indirectly promotes it by enhancing the level of peer support among overweight and obese children.

**Key Words:** Overweight and Obese Children, Community Sports nEnvironment, Peer Support, Physical Activity

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## Effect of Athletes' Burnout on Psychological Resilience: The Chain Mediating Effect of the Meaning in Life and Perceived Social Support

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This study aims to explore the relationship between athletes' burnout, the meaning in life, perceived social support, and psychological resilience. We adopted the Athlete Burnout Questionnaire (ABQ), Perceived Social Support Scale (PASS), the Meaning in Life Questionnaire (MLQ) and Connor-Davidson Resilience Scale (CD-RISC) to obtain data from 344 professional athletes, and used correlation analysis, regression analysis and mediation effect analysis to make data analysis. We found that (1) burnout had a significant negative correlation with the meaning in life ( $r=-0.23$ ,  $p<0.01$ ), perceived social support ( $r=-0.23$ ,  $p<0.01$ ) and psychological resilience respectively ( $r=-0.22$ ,  $p<0.01$ ); while the meaning in life had a significant positive correlation with perceived social support ( $r=0.46$ ,  $p<0.01$ ) and psychological resilience respectively ( $r=0.60$ ,  $p<0.01$ ), and perceived social support also had a significant positive correlation with psychological resilience ( $r=0.61$ ,  $p<0.01$ ). (2) perceived social support and the meaning in life played a significant mediating role between athletes' burnout and psychological resilience [ $\beta=-0.19$ , 95%CI (-0.28, -0.09),  $p<0.05$ ]. The results suggested that athletes' burnout can affect psychological resilience both directly and through the chain mediating effect of the meaning in life and perceived social support.

**Key Words:** athletes burnout, the meaning in life, perceived social support, psychological resilience

## Retrospective analysis of flow experience and participants of different dance types

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This study aims to review the flow experience in related activities of dance class students in artistic talent classes and leisure sports dance participants. It mainly focuses on: the above two types of dance-related participants and their learning motivations for participating in various activities and course learning satisfaction. Degree, dance competition and performance and learning achievements, including a retrospective analysis of the relationship between the addition of physical and mental movement education and flow experience. Mainly searching the

literature of Chinese online journals and master's and doctoral thesis websites, we found 14 empirical studies published between 2009 and 2023. We compared and analyzed the research results of each article and then described them. The analysis results show that in the first part, the relationship between the learning satisfaction, learning effectiveness, and learning motivation of students in the dance class of the artistic talent class and dance-related performances, competitions, and professional courses, and their flow experience is slightly moderate, but most of them are. There is a high correlation; in the second part, the participants of leisure sports dance and community dance sports have a positive and significant impact on leisure motivation, leisure benefits, body image and happiness, and flow experience. In the third part, for students in the dance class of the artistic talent class, the use of physical and mental movement education courses can effectively enhance their physical and mental awareness and flow experience. Based on these findings, some suggestions are put forward. This review only analyzes domestic empirical research articles. It is true that there are very few studies on dance-related aspects and flow experience, including other professional subjects such as dance in artistic talent classes and leisure dance sports. Related research is conducted on other dance courses for reference by future interested researchers.

**Key Words:** Dance class students in artistic talent classes, Leisure sports dance participants, Learning motivation, Learning satisfaction, Flow experience

## A Study On The Effects Of Eomatosensory Interactive Game Intervention On Preschool Children's Perceptual-Motor Ability And Fundamental Movement Skills

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This study aims to explore the impact of an 8-week somatosensory interactive game intervention on preschool children's perceptual-motor ability and fundamental movement skills, with the goal of providing a scientific basis for improving preschool children's motor ability. A total of 56 preschool children aged 4 to 5 years old were selected and randomly divided into an experimental group ( $n=27$ ) and a control group ( $n=29$ ). The experimental group underwent an 8-week intervention program of structured somatosensory interactive game exercises, while the control group received no intervention. Before and after the 8-week somatosensory game intervention, the Perceptual-Motor Skills Checklist (PMSC) developed by Barnett and the Test of Gross Motor Development, Third Edition (TGMD-3) were used to assess the perceptual-motor ability and fundamental motor skills scores of all participants. Paired-sample t-tests were performed on the data to analyze the effects of the intervention. The study results showed that after the 8-week somatosensory interactive game intervention, the experimental group exhibited significant improvements in both perceptual-motor ability and fundamental



motor skills scores ( $p < 0.05$ ), while no significant changes were observed in the control group. The experimental group demonstrated a notable increase in total scores, whereas the improvement in the control group was relatively minor. The 8-week somatosensory interactive game intervention significantly enhanced the perceptual-motor ability and fundamental motor skills of preschool children. This intervention method provides an effective means for improving preschool children's motor ability and lays a foundation for their future development of fundamental motor skills.

**Key Words:** Somatosensory interactive game, Exercise intervention, Preschool children, Perceptual-motor ability, Fundamental motor skills

Abstract ID: SP0179

### Research on the Application Status of Somatosensory Interaction Technology in Motor Intervention for Children with Autism

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This study aims to systematically evaluate the current application status of somatosensory interaction technology in motor intervention for children with autism, summarize the advantages and disadvantages of related technologies, and explore future directions for development to provide reference. Methods: 1. Literature review; 2. Case analysis. Results: 1. The main types of somatosensory interaction technology intervention include intervention methods based on Microsoft Kinect, Nintendo Wii, and virtual reality technology. These technologies can stimulate the interest and motivation of children with autism to participate in sports through highly interactive games and tasks; 2. Somatosensory interaction technology intervention can significantly improve the physical activity level of children with autism; 3. There are still problems in empirical research, such as the lack of uniform standards for researchers' selection and application of somatosensory interaction technology, which limits the comparability of experimental results. Some studies have small sample sizes, which affects the universality of the results; 4. The price of equipment required is relatively high, such as sensors, and specialized venues are needed for intervention training. In addition, the application of technology requires teachers to have professional knowledge and skills, be able to operate equipment and develop programs skillfully, and make personalized adjustments based on individual differences of children. Somatosensory interaction technology has been effectively applied in motor intervention for children with autism, and has shown positive effects in improving their motor skills and social skills. However, there are also some problems and challenges in practical applications, such as insufficient consideration of individual differences of children and insufficient popularity of the technology. Therefore, future research should further explore how to better apply this technology to solve existing problems and challenges, so as to maximize the advantages.

**Key Words:** Somatosensory interaction technology, Children with autism, Exercise intervention, Application status

Abstract ID: SP223

### Swinging To Success: Impact of a 4-Week Chewing Gum Routine on Psychophysiological Responses and Putting Performance in Female Golfers

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Chewing gum was associated with increased productivity and reduced cognitive errors, including reduced stress and anxiety. Increased pressure is one of the common factors contributing to poor golf putting performance. This study investigated the effect of 4-weeks of chewing gum on psychophysiological variables and putting performance among female golfers. Forty-one female golfers participated in a true experimental randomized pre-test and post-test control group study. The golfers were divided into two groups: (1) Chewing Gum Group (CG) ( $n=20$ ) and (2) Non Chewing Gum Group (NCG) ( $n=21$ ). The CG went through an intervention of 4 weeks of daily gum chewing, one pallet each day and chewing for at least 10 minutes at a time. Whereas, the NCG group was restricted from chewing gum for 4 weeks. The parameters of anxiety level (CSAI-2 scores), heart rate and putting scores were taken. Results showed that there was a significant ( $p=0.00$ ) improvement in the post-putting score in the Chewing Gum Group ( $3.00 \pm 0.92$ ) compared to the Non Chewing Group ( $2.10 \pm 0.89$ ). A non significant but positive trend showed that in Chewing Gum Group anxiety was reduced by 4.11% [Pre; ( $55.90 \pm 8.10$  to Post;  $53.60 \pm 3.84$ ), heart rate was reduced by 3% [Pre;  $92.02 \pm 6.43$  to Post;  $89.30 \pm 8.68$ ] and an improvement for putting scores in the Chewing Gum Group by 25% compared to Non Chewing Gum Group had a decline in putting performance by -11.8%. Therefore, the study concluded that chewing gum for 4-weeks may be an inexpensive intervention that improves putting performance and reduces anxiety.

**Key Words:** chewing gum, anxiety, putting, golf, performance

Abstract ID: SP227

### THE MEDIATING ROLE OF DISPOSITIONAL OPTIMISM IN THE RELATIONSHIP BETWEEN ATHLETES' QUALITY OF SLEEP AND MENTAL ENERGY: A CROSS-SECTIONAL STUDY

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Although extant literature indicates that sufficient sleep links to many positive consequences, its association with athletes'

mental energy has never been examined. This study aimed to examine the triangular relationships among athletes' quality of sleep, mental energy, and optimism and explore the mediating role of optimism. We administered the Pittsburgh Sleep Quality Index, the Life Orientation Test-Revised, and the Athletic Mental Energy Scale to 316 college student-athletes who engaged in diverse sports. Bivariate correlation analyses found that athletes' quality of sleep, mental energy, and optimism all correlated with each other. Further, multiple hierarchical regressions found that optimism partially mediated the relationship between quality of sleep and mental energy. The preliminary findings advance our understanding of the influence of the quality of sleep on athletes' mental energy, and the role of optimism. We suggest offering sleep management programs for athletes to promote healthy sleep for athletes' health, performance, and mental energy. We also propose several suggestions for future studies.

**Key Words:** Sleep psychology, Positive psychology, Psychology of sport excellence, Psychological well-being

Abstract ID: OT048

### Clinical Psychometrist Properties of unsupported upper-limb exercise test in measuring upper limb function after median sternotomy

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The Unsupported Upper Limb Exercise Test (UULEX) is a performance-based test and can be used to evaluate upper limb performance (function and endurance) following median sternotomy. To date, there is no performance-based test post median sternotomy to evaluate upper limb function which may help in rehabilitation outcomes. The aims of this study were: i. to examine the reliability, validity and responsiveness of UULEX; ii. to determine the minimal clinical importance difference (MCID) in individuals following median sternotomy. A total of 56 participants following median sternotomy completed the unsupported upper limbs test (UULEX) and other measures of upper limbs (UL) function, and health-related quality of life at baseline(pre-operatively), prior to discharge, at 4-6 weeks and 3 months post-operatively. The validity was evaluated using correlation. The responsiveness using Friedman one-way repeated measure. Reliability was evaluated using intraclass correlation coefficients (ICCs). Distribution-based calculation was used to calculate the minimal clinical important difference (MCID). The median (IQR) for the UULEX was 18.7(12.1) at baseline; prior to discharge was 9.6(8.8), 17.4(11.2) at four weeks and 23.8(12.2) at three months respectively. Validity(construct): fair to moderate correlation with other UL function measure and health related quality of life. Reliability: The UULEX had good internal consistency (Cronbach's alpha = 0.86). Strong responsiveness overtime was demonstrated with large effect sizes (Cohen's d=0.8) at prior to discharge time points. The MCID of the UULEX was calculated between 2.4-6.1 in minutes. The UULEX is valid, reliable, responsive with known MCID in measuring upper limb function after median sternotomy.

This test can be used to quantify important functional limitations of upper limb function and trunk in this population.

**Key Words:** Cardiac Surgery, clinical Psychometric assessment, Upper Limbs Function, Minimal Clinical Important Difference

Abstract ID: MG131

### A REVIEW OF MALAYSIAN SPORTS GAMES (SUKMA) BY STATES AND GENDER

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A biennial multi-sport event in Malaysia called SUKMA, which stands for "Sukan Malaysia" or the Malaysian Games, serves as a platform for young athletes to showcase their talents. It can be considered the highest competition level among young athletes at the national level, and this game started as early as 1986. This study aimed to describe athletes' game achievements by analysing medallists by state and gender. This study uses secondary data formally obtained from the Majlis Sukan Negara. Data on the participation of SUKMA athletes, medal tally, and medallists in three SUKMA events (Sarawak 2016, Perak 2018, Kuala Lumpur 2022) were gathered and analysed. The medallist data was categorised using a scoring system (gold = 3, silver = 2, bronze = 1). Overall, the average participation in SUKMA games is 5,834 athletes, with a ratio by gender of 60:40 (male: female). Throughout these three events, the highest collection of SUKMA medals by state is Selangor, followed by Terengganu, Sarawak, Wilayah Persekutuan and Pahang. Meanwhile, Penang, Negeri Sembilan, and Terengganu showed an ascending trend in medal collection. However, based on the medal score, this study found that Wilayah Persekutuan, Perak, and Johor are among the top three states with the highest medal score. Athletics and swimming have the highest medal scores, indicating that many events are contested in these sports. In addition to gender, Perak and Terengganu both equally have the highest gold scores by male athletes (n = 636), and Wilayah Persekutuan has the highest gold scores by female athletes (n=693). In conclusion, the athletes participation in SUKMA is almost equal to gender, but there was a massive gap between states. More exciting findings can be highlighted from the secondary data to provide a better understanding and point to the need for future preparation.

**Key Words:** SUKMA, medal, state, gender

Abstract ID: SP0148

### The Benefits of Exercise on Reactive motor control for Seniors: is 65 years a Cut-off Point?

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"Retirement at age 65" has raised public concern in China about incompetence of work for seniors in their sixties. The deterioration of reactive motor control with the increase of age is

a risk factor for incompetence at work. Exercise, open-skill in particular, has been found to be able to improve reactive motor control in seniors. Yet it remains unclear whether different types of exercise work differently for those below or above age 65. One hundred and eighteen seniors (below 65, N=41, age range, 58-65, mean±SD=62.56±2.1 years; above 65, N=77, age range, 66-76, mean±SD=69.51±2.73 years) with either open-skill, closed-skill exercise experience or without regular exercise experience (the control group) were recruited. Reactive motor control abilities were assessed by stop-signal response time using the stop-signal task. Single-factor ANOVA was used to compare differences in reactive motor control among exercise types. With exercise type, age group (below age 65 = -1, above age 65 = 1) and the interaction of exercise type and age group as predictors and stop-signal response time as dependent variable, linear regression analysis was used to test whether the effect of exercise type affects reactive motor control differently for seniors below or above age 65. Single-factor ANOVA results showed that the open-skill group performed reactive motor control significantly better than the close-skill group and the control group; no significant difference was found between the close-skill group and the control group. Linear regression analysis results showed the coefficients of age group or the interaction between age group and exercise type were not significant. These findings suggest that exercise types affect reactive motor control differently with open-skill exercise show advantages, and that these effects are similar for seniors below or above age 65. Thus, exercise, especially open-skill type, can serve as maintenance strategies for reactive motor control ability in seniors in their early or late old age.

**Key Words:** exercise, reactive motor control, seniors, cutoff point, retirement delay

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Abstract ID: OT128

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**A study on the effect of rapid extension and retraction based compound training on Chinese junior high school students' standing long jump performance**

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Rapid extension compound training, also known as augmented training or super isometric training, is a training method that involves rapid lengthening of muscles immediately followed by rapid shortening. For sports that require fast explosive power and speed, rapid extension compound training can significantly improve their explosive power and strength and thus improve sports performance. This paper is based on an in-depth study of the effect of rapid extension compound training on the vertical jump performance of junior high school students, which directly improves the vertical jump performance of junior high school students. In this study, experimental method, literature method and mathematical statistics method were used to select 40 students as experimental subjects (n=40) for a three-month intervention in a junior high school in Wuhou District, Chengdu City, China, in which the experimental group (n=20) carried out the rapid telescopic compound training, and the control group

(n=20) carried out only the traditional long jump training. The data before and after the experiment were finally analyzed using SPSS 27.0 statistical software. Result: (1) Before and after training, the experimental group's performance showed significant differences ( $P<0.01$ ), while the control group's performance after training was significantly different from that before training ( $P<0.05$ ). (2) The performance of the experimental group and the control group before the training intervention did not present a significant difference ( $p>0.05$ ), while the performance of the experimental group and the control group after the training intervention presented a significant difference ( $p<0.01$ ). Rapid extension compound training enhances the speed and length of the muscles subjected to pulling, and better enhances the speed of excitation in the nerve-muscle conversion, which has a significant effect on improving the performance of junior high school students in standing long jump.

**Key Words:** rapid extension compound training, standing long jump, super isometric contraction training

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Abstract ID: OT101

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**Effectiveness Of Taichi Exercises On The Focus Among Secondary School Students In China**

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This study investigated the benefits of tai chi practice on concentration in Chinese secondary school students. Recognizing the Chinese government's emphasis on teenage physical and mental development, the study sought to discover whether tai chi might considerably improve students' focus, which is required for academic performance and general growth. The objectives of the study were 1) to identify differences between concentration levels of tai chi and control groups before and after the intervention and 2) to assess the specific effects of tai chi on concentration compared to traditional physical education. This study used an experimental research design in which 80 (40 boys and 40 girls) secondary school students were randomly assigned to a tai-chi group and a control group. The age of the students ranged from 12-15, mean = 14.14, SD = 0.78272. Over a 10-week period, the tai chi group trained 24 different tai chi styles for 60 minutes each day, while the control group continued with their regular physical education regimen. The Schulte square method was used to assess concentration levels, with pre- and post-tests to compare differences across groups. After the test, the t-test on the mean difference between the two groups showed t value= 2.121( $p<0.05$ ). These results show that there is significant difference between tai chi group and control group after experimental. The results suggest that tai chi is an effective means of improving concentration in secondary school students and should be included in school physical education programs. The study also calls for further research on the impact of tai chi on other cognitive processes and mental health, and future studies should include a larger sample to help inform educational policy development.

**Key Words:** Tai chi, Focus, Secondary school student

Abstract ID: OT156

### **A Comparative Analysis of Physical Education Teacher Training Programs: Validating a Chinese Theoretical Framework in Scotland and Australia**

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Recognizing the development of physical education (PE) teachers professional learning as the cornerstone of high-quality PE, this study evaluates the international applicability of a theoretical framework for PE teacher training devised by Yin et al. (2016) in the Chinese context. The framework, which promotes a "health first" philosophy, integrates pedagogical and academic principles to develop PE teachers proficient in advancing the physical and mental health of their students. It aims to balance educational and skill-based courses while ensuring curriculum content is practical, timely, and aligned with foundational education reform. Employing a comparative document analysis approach, this research examines PE teacher training programs at the University of Edinburgh and the University of Sydney. The study focuses on the distribution of course offerings and credits across four categories: health, pedagogy, supplementary subjects, and subjects tied to foundational education reform. The evaluation reveals that the University of Edinburgh and the University of Sydney interpret and integrate the framework distinctively. Edinburgh accentuates the theoretical facets of pedagogy, whereas Sydney focuses predominantly on the practical aspects of health education. Both adaptations reflect the institutions' alignment with their regional educational policies and underscore the framework's flexibility and relevance across diverse educational contexts. This research substantiates the framework's broad applicability and efficacy in non-Chinese educational contexts, particularly within Western settings. It bridges theoretical concepts with practical applications, offering a robust model for guiding international PE teacher training programs. Although the study is limited to two universities, it paves the way for further comparative research across more diverse educational environments.

**Key Words:** Physical Education, Curriculum Standards, Comparative Analysis, Professional learning

Abstract ID: ES029

### **The effects of exercise on vascular fibrosis with aging as an epigenetic regulator**

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Aging is known to induce changes in vascular function and structure, while exercise can delay these aging-associated changes in vasculature. Previous studies indicate that epigenetic regulation plays a role in the aging process. However, the epigenetic effects of aging on changes in vascular function and

structure and exercise-induced anti-aging effects are poorly understood. Thus, we explored the underlying mechanisms of detrimental aging effects and the anti-aging effect of exercise on the vasculature, mainly focusing on histone modification. Using a mouse model, the study aims were: 1) to identify histone marks altered with aging in the aorta, 2) to elucidate the epigenetic mechanisms in which aging-associated changes in histone marks contribute to vascular aging, and 3) to evaluate the anti-aging effects of exercise on the aorta via histone mark modification. Aged(18-mo) and young(4-mo) C57BL/6 male mice were exercised acutely or trained for 8 weeks on the rodent treadmill. Then, aortas were collected and processed accordingly. It was found that H3K27me decreased and H3K27ac complementarily increased with aging in the aortas. Also, we found transcriptional changes in many genes with aging, including genes known to play a role in vascular fibrosis. In addition, it was found that the enrichment of H3K27ac increased in the transcriptional regulatory region of those fibrosis genes, therefore suggesting the vascular aging mechanism through histone modification. On the contrary, increased H3K27ac and decreased H3K27me with aging were ameliorated by both an acute exercise or long-term exercise training, and increased enrichment of H3K27ac on the transcriptional regulatory region of fibrotic genes was also ameliorated. It was further supported by the finding that the expression level of aging genes was decreased. We newly found histone marks modified with aging in mouse aorta and their roles in transcriptional regulation of vascular fibrosis genes. On the other hand, both acute exercise and exercise training ameliorated these histone modifications, therefore helping to prevent vascular aging. Our study produced results revealing one of the epigenetic mechanisms for vascular aging in small animals and thus warrants a future study using large animals or clinical studies. Ultimately, these findings highlight the importance of exercise for maintaining vascular health as a novel anti-aging therapy.

**Key Words:** Exercise, Aging, Histone modification, Vasculature, Fibrosis

Abstract ID: ES228

### **Effects of PNF Stretching Combined with Lower Body Muscle Strength Training on Balance Ability in the Elderly**

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Improving lower limb muscle strength is essential for enhancing balance and preventing falls in the elderly. PNF stretching into regular strength training can significantly enhance stability and reduce the risk of falls in the elderly. The purpose of this study was to examine the effects of PNF stretching combined with lower body muscle strength training on the balance ability of the elderly. Twenty male older adults (aged 60-70 yrs) were randomly assigned into control (CON, n=10) and experimental (EXP, n=10) groups. The control group received lower limb muscle strength training intervention, whereas the experimental group received PNF stretching combined with lower limb muscle strength training intervention. These interventions were



conducted for 6 weeks, three times a week, 40 minutes per session. The balance ability tests, including static balance and dynamic balance index using Biodex Balance System were conducted before and after the intervention in both groups. Results: Showed that static balance in EXP group improved significantly as compared to CON group ( $p < 0.05$ ). However, no significant difference was found between EXP and CON groups in the dynamic balance index ( $p > 0.05$ ) after 6 weeks of intervention. Six weeks of PNF stretching combined with lower limb muscle strength training has improved the balance ability in the elderly.

**Key Words:** static balance, dynamic balance, PNF

Abstract ID: ES234

### The Effects of Long-Term Regular Resistance Training on Physical Fitness in the Elderly: A Three-Year Follow-Up Study

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**Purpose:** With the rapid global aging population, delaying physical decline in the elderly has become a significant public health issue. Taiwan is projected to become a super-aged society in the coming years, with over 20% of its population being 65 years or older. Many community care centers in Taiwan primarily offer simple bodyweight exercises, occasionally supplemented with resistance bands or other equipment. However, these forms of exercise seem insufficient to prevent sarcopenia and maintain physical fitness levels in the elderly. International research indicates that resistance training significantly enhances muscle strength, improves balance, and boosts overall physical fitness. Therefore, this study aims to investigate the effects of long-term regular resistance training on the physical fitness of the elderly. We conducted a three-year follow-up exercise intervention using pneumatic resistance machines, where participants engaged in 60-minute training sessions twice a week. The impact on various physical fitness indicators was systematically assessed. **Methods:** This study conducted a three-year intervention where participants engaged in 60-minute resistance training sessions twice a week. The training utilized pneumatic resistance machines to provide consistent resistance. Physical fitness assessments included Bioelectrical Impedance Analysis (BIA) for body composition, grip strength, waist-hip ratio, five-time sit-to-stand test, back scratch test, chair sit-and-reach test, 5-meter walk test, and 6-minute walk test. Data were analyzed using Paired-Sample t tests to determine the significance of changes in physical fitness indicators, with a significance level set at  $p < 0.05$ . **Results:** Among the 24 elderly participants, significant improvements were observed in the following physical fitness indicators after three years of training: muscle mass ( $p < 0.01$ ), sit-to-stand time ( $p < 0.01$ ), chair sit-and-reach distance ( $p < 0.01$ ), and 5-meter

walk speed ( $p < 0.05$ ). These results suggest that long-term regular pneumatic resistance training has a positive impact on the physical fitness of the elderly. **Conclusion:** The findings of this study highlight the potential benefits of incorporating pneumatic resistance training into community care programs. Such interventions can play a crucial role in maintaining and improving the physical fitness of the elderly, thereby contributing to the overall health and well-being of Taiwan's aging population.

**Key Words:** Elderly, Resistance Training, Physical Fitness, Super-Aged Society

## EXERCISE SCIENCE

Abstract ID: OP-ES232

### University Students' Chronotype and Factors Affecting Their Sleep Patterns

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Optimal daily functioning relies heavily on adequate sleep, which is regulated by circadian rhythms varying among different chronotypes. This study explores the relationship between chronotype and sleep patterns in university students, highlighting key individual and environmental influences on their sleep. A sample of 237 university undergraduates (mean age =  $20.68 \pm 1.46$  years) completed a self-report online questionnaire assessing sleep behavior, school schedule, stimulant use, pre-sleep routine, health-promoting behavior, mental health, and physical activity. Chronotype and sleep patterns were measured using the Munich Chronotype Questionnaire (MCTQ). Kutcher Adolescent Depression Scale (KADS) were used to measure symptoms of depression. International Physical Activity Questionnaire-Short Form (IPAQ-SF) was used to measure physical activity level. Independent T-test revealed that females have more sleep loss (3hr) than male (2hr 20min) ( $t=2.440$ ,  $p < .05$ ). This result means that female's sleep quality is lower than male. Simple Linear regression analyses identified chronotype as the predictor of KADS score ( $R^2 = .028$ ,  $\beta = .187$ ,  $p < .05$ ), which means students with earlier chronotype have lower depressive symptoms. Physical activity is negatively correlated with sleep loss ( $R^2 = .017$ ,  $\beta = -.145$ ,  $p < .05$ ), means students with more physical activities will decrease their sleep loss. These findings suggest that targeted interventions addressing these factors could effectively mitigate sleep deprivation among university students, and encourage students having earlier chronotype to enhance their physical and mental health.

**Keywords:** Chronotype, Sleep Patterns, MCTQ, KADS-11

Abstract ID: OP-ES064

### **Preliminary Findings: Effects of Combination Supplementation of Lignosus Rhinocerus and Eurycoma Longifolia on Endurance Running Performance among Athletes**

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Multi-ingredient pre-workout supplements (MIPS) are a novel category of dietary supplement to improve athletic performance. The combination of supplementation of Lignosus Rhinocerus and Eurycoma Longifolia on endurance running performance in the field test are still scanty information among athletes. The objective of this study was to investigate the effects of combination supplementation of Lignosus Rhinocerus and Eurycoma Longifolia on endurance performance among athletes. Five athletes (age:  $20.8 \pm 1.1$  years; body mass index (BMI):  $22.2 \pm 3.5$  kg.m<sup>-2</sup>; body fat percentage:  $16.8 \pm 2.7$  %; Visceral fat:  $5.4 \pm 2.9$  %; Skeletal muscle:  $35.8 \pm 1.0$  %) were recruited in this randomised cross-over study. Subjects consumed combination supplementation of Lignosus Rhinocerus and Eurycoma Longifolia or placebo for 6 days prior to the endurance running test. On the experimental trial, subjects consumed combination supplementation of Lignosus Rhinocerus and Eurycoma Longifolia one hour before the endurance running test. Time to complete the 2.4 km test, heart rate, rate of perceived exertion (RPE), maximum oxygen consumption (Vo<sub>2</sub>max), blood pressure and body weight were measured in the both trials. The wash out period between the trials was one week. Data was expressed in mean  $\pm$  standard deviation. Pair-t test was used to compare endurance running performance between the trials. This study discovered combination supplementation of Lignosus Rhinocerus and Eurycoma Longifolia trial had a shorter time to complete 2.4 km run test and had a higher maximum oxygen consumption in comparison with the placebo trials, but it did not achieve statistically different. There was no significant difference in heart rate, rate of perceived exertion, blood pressure and body weight between the trials. This study reflected that 6-day supplementation of combination of Lignosus Rhinocerus and Eurycoma Longifolia and 1 hour before endurance running has ergogenic effects on endurance running performance. However, it still warranted a larger sample size of subjects to reconfirm these findings.

**Key Words:** Lignosus Rhinocerus, Eurycoma Longifolia, 2.4 km run test, heart rate, rate of perceived exertion

Abstract ID: OP-SP0218

### **A Systematic Review and Meta-Analysis of Exercise for Reducing Cravings and Enhancing Health Parameters Among Peoples with Stimulant Use Disorder**

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The recovery of stimulant use disorder remains an unsolved problem and has a serious impact on individuals and communities. This study aimed to investigate the evidence on the effect of exercise on the physical and mental health of individuals suffering from stimulant use disorder. We systematically searched several online databases up to the end of July 2024, including PubMed/MEDLINE, Scopus, Science Direct, Cochrane Library, Web of Science and Google Scholar. All relevant articles were identified, screened, and included based on inclusion or exclusion criteria. The methodological quality of the included studies was assessed using the Cochrane Handbook for Systematic Reviews of Interventions. We employed both random and fixed effects models to analyse the standardised mean difference (SMD) or mean difference (MD) and their 95% confidence interval (CI). A total of 13 studies, involving 896 participants with stimulant use disorder were included in the analysis. The results of the meta-analysis indicated that exercise significantly reduces drug craving (MD = -4.52, 95% CI: (-7.73, -1.31),  $p = 0.006$ ); decreasing abnormal heart rate (MD = -4.76, 95% CI: (-5.13, -4.40),  $p < 0.001$ ), and improves sleep quality (MD = -2.82, 95% CI (-4.44, -1.21),  $p < 0.001$ ). Therefore, exercise proves to be an effective intervention for improving drug cravings, heart rates, and sleep among individuals with stimulant use disorder. This study provides evidence on future research and treatment strategies for stimulant use disorder.

**Key Words:** Exercise intervention, Stimulant use disorder, Craving, Health parameters, Methamphetamine

Abstract ID: OP-ES0190

### **The Effect of Caffeine Mouth Rinse on Strength Performance**

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Caffeine consumption is commonly used as an ergogenic aid to enhance athletic performance by increasing fatigue resistance whilst maintaining a high neural output from the central nervous system i.e. force production. However, ingestion of high doses of caffeine (> 400 mg per day) can cause insomnia, gastric acid secretion, and overstimulation jittering feeling throughout the day. Interestingly, it has been shown that caffeine mouth rinse (CMR) is able to stimulate the oral receptors which in turn activates cortico-motor areas in the brain which are responsible for maintaining force generation. However, there's lack of study to support this phenomenon during an isokinetic, maximum voluntary contraction (MVC) and during a fatiguing task. To investigate the effects of CMR on MVC and Repetition-to-Failure (RTF). A randomised cross-over design was employed where 11 healthy resistance-trained males were prescribed with CMR and placebo (PLA) in a randomised order, prior to performing an MVC and RTF. The MVC tests involved 5 sets of 5s maximal voluntary contraction on isokinetic knee extension at 60°/s with maximal efforts on dominant leg; the mouth rinse solution was given before commencement of each set. Two minutes after the MVC test, they were given another mouth rinse right before the

RTF test at 120°/s. A 10 s mouth rinsing was applied on all occasions. A two-way repeated ANOVA showed no differences in MVC between the CMR and PLA. Interestingly, there was a significant group x time interaction in RTF, where CMR was significantly better compared to PLA ( $P < 0.05$ ). CMR is able to sustain force production for longer, thus attenuating fatigue compared to PLA despite lack of difference in MVC. These findings suggest that CMR can be used as a strategy to evade muscular fatigue by sustaining force production.

**Key Words:** caffeine mouth rinse, ergogenic aid, repetitions to failure, maximal voluntary contraction

Abstract ID: OP-OT03

### Effects of Anaerobic Performance on Judo athletes of women by Anaerobic endurance training of Climbing plate

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This study explored the influence of climbing plate intervention on athletes' physical function, training load and effect, and special anaerobic endurance level through monitoring the athletes' related physiological and biochemical indicators. It provides a certain reference for the innovation of the concept and method of anaerobic endurance training for women's judo in China. Five +78kg elite athletes of the National women's judo team preparing for the Tokyo Olympic Games were selected as experimental subjects in this study. Taking the national women's judo team's 3 months training before the intervention of climbing plate as the pre-test and the 3 months training after the intervention as the post-test. In the climbing plate into national women's judo after big level athletes special physical training, through Omegawave system, Firstbeat system, blood lactic acid and other biochemical indicators and monitoring means such as climbing a fitness test on a plate, the athlete's body function condition, training load, training effect, specific aspects such as the change of the anaerobic endurance level monitoring. Results: (1) The percentage of HRmax, training impulse (TRIMP) and training effect (TE) were significantly increased ( $P < 0.01$ ). (2) The Bla, the climbing plate, and the anaerobic ability index and the duration in the 80%-90% and 90%-100% heart rate zone increased significantly ( $P < 0.01$ ). Compared with other specific anaerobic endurance training methods, the blood lactic acid (Bla) value after climbing plate training was the highest, and the physical fitness test score of climbing plate showed an increasing trend month by month. Conclusion: (1) Athletes' training load intensity and amount of exercise increased after climbing plate intervention. The training load was reasonable, and the training effect was good. (2) After the involvement of climbing plate, athletes' specific anaerobic endurance showed an uptrend. The results show that the climbing plate training may have beneficial effects on improving the specific anaerobic endurance of senior judo athletes.

**Key Words:** Climbing plate, Anaerobic performance, Judo athletes

Abstract ID: OP-ES0212

### The Effects of Fatigue on Badminton Smash Performance and Core Stability Parameters among Badminton Players

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This study examines the effects of fatigue on badminton smash performance and core stability in state-level Malaysian badminton players, emphasizing the importance of targeted training and recovery strategies to sustain performance under fatigue. Sixteen healthy male players (Age:  $21.06 \pm 1.73$  years; Experience:  $12.81 \pm 2.20$  years; Height:  $175.6 \pm 5.0$  cm; Weight:  $67.3 \pm 10.3$  kg) participated in the study. Each player completed fifteen badminton smashes and a battery of core stability tests (including endurance, flexibility, and functional assessments) both before and after a fatigue-inducing protocol. The protocol consisted of intermittent exercise (40s work, 20s rest per stage) across two sessions with a one-week recovery period in between. Fatigue levels were monitored through heart rate, blood lactate, and perceived exertion (RPE). Results demonstrated a significant decline in badminton smash parameters post-fatigue ( $p < 0.001$ ), including shuttlecock speed (-22.0%), racket swing speed (-7.4%), and smash accuracy (-35.3%). Core stability assessments revealed decreased endurance across trunk flexor (-50.1%), trunk extensor (-26.8%), and lateral trunk muscles (Left: -29.0%, Right: -27.6%) on both sides ( $p < 0.05$ ). The Upper Quarter Y-Balance test indicated reduced reach in the mediolateral direction for the left limb (-6.3%) and the inferolateral direction for the right limb (-3.3%) ( $p < 0.05$ ), with no notable changes in other directions. No significant differences were found in left and right hamstring stiffness. The findings confirm that fatigue negatively affects both badminton smash performance and core endurance. These insights highlight the need for specialized training and recovery interventions aimed at minimizing the impact of fatigue, thus supporting sustained performance and stability. Implementing these strategies could lead to improved training outcomes and enhanced competitive readiness.

**Key Words:** Badminton Smash, Core Stability, Fatigue

Abstract ID: OP-ES241

### Effects of different protocols of HIIT recovery phase on working memory and emotional regulation of sedentary young women

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The aim of the current study is to explore the effects of various protocol parameters applied in HIIT recovery phase on working memory (WM) and emotional regulation (ER) for sedentary young women. Thirteen sedentary women (age:  $20.08 \pm 1.32$  years; BMI:  $21.58 \pm 2.30$  kg/m<sup>2</sup>) participated in a randomized

crossover trial. The trial included two pairs of recovery protocols that varied in work-to-rest time ratio (W/R) and recovery activity (RA). The protocol pairs were as follows: A) breath counting (BC) vs. passive recovery (PA) and B) W/R of 1:1 vs. W/R of 1:2. Before and after each condition, the participants completed the measurements for WM and ER, including N-back task, facial emotion recognition task (FER), and positive and negative affect schedule (PANAS). The results of response time (RT) showed that all the conditions with the significant decrease in N-back (W/R:  $P < 0.01$ , RA:  $P < 0.01$ ) and FER (W/R:  $P < 0.05$ , RA:  $P < 0.01$ ). In addition, there was a significant difference between the pairs of W/R (N-back:  $p < 0.01$ , FER:  $p < 0.05$ ) and RA (FER:  $p < 0.05$ ) respectively. In terms of PANAS, two groups of W/R had significant change between pre and posttest ( $p < 0.05$ ). Meanwhile, the 1:2 interval ratio was significantly better than the counterpart ( $p < 0.01$ ). The mode of the interval phase including W/R and RA applied in acute HIIT can produce beneficial impact on working memory and mood regulation in sedentary young women. The findings in the present study suggest the advantage of breath-counting recovery and longer interval ratio in the improvement effects.

**Key Words:** HIT, recovery phase, working memory, emotional regulation, sedentary young women.

## SOCIO-CULTURAL ANALYSES OF SPORTS

Abstract ID: OP-SC214

### Research on Status and Sustainable Development of home of Martial Arts in Henan Province

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The research carried out a comprehensive investigation and analysis of the current status, offering solutions to ensure the sustainable development of the home of martial arts in Henan Province. Method: (1) Expert interview, interviews were conducted with managers and experts from the eight "Home of Martial Arts" in Henan Province, and an interview outline was developed. The results of the significance test show that the correlation coefficient for practitioners is  $R = 0.859$ , and for managers,  $R = 0.879$ ,  $P < 0.01$ , indicating that the reliability of the questionnaire is valid. (2) Questionnaire Design, Administrators two sets of questionnaires were designed for martial arts administrators and practitioners. The martial arts administrators questionnaire addressed the martial arts business, infrastructure, economic impact, and financial support; The martial arts practitioners questionnaire addressed exercise habits, martial arts sport categorization, gender, and exercise frequency. Experts were invited to provide feedback on the validity and scientific basis of the content, and reliability and validity tests were conducted. The valid distribution and return rates of the questionnaires were 100% and 96.8%, respectively. (3) Data was organized and analyzed using SPSS statistical software.

Cronbach's alpha coefficient was tested using reliability and validity, and t-tests. Further comparison reveals that Henan Province has significant advantages in the martial arts sector, particularly in the number of martial arts schools ( $p = 0.03$ ), number of participants ( $p = 0.02$ ), and economic impact ( $p = 0.01$ ). Additionally, Henan stands out in addressing issues like resource shortages ( $p = 0.04$ ) and infrastructure deficiencies ( $p = 0.03$ ), and also shows superior potential in tourism ( $p = 0.02$ ) and cultural event audience numbers ( $p = 0.04$ ) compared to other provinces. However, the effectiveness of funding support recommendations ( $p = 0.06$ ), community engagement growth ( $p = 0.08$ ), and policy support recommendations ( $p = 0.05$ ) is relatively weaker. Overall, Henan Province excels in martial arts development, but there is room for improvement in the effectiveness of solutions and policy measures. As the home of martial arts in Henan Province, it excels in the number of martial arts schools, participant numbers, and economic impact. However, there are significant deficiencies in funding support, community engagement, and policy effectiveness. Although it has notable strengths in martial arts development, it is crucial to enhance the implementation of related policies and propose additional solutions to promote sustainable growth.

**Key Words:** status, home of martial arts, sustainable development

Abstract ID: OP-SC177

### A Study on the Spatial Distribution Pattern and Causation Analysis of National Fitness Model Areas (Counties) in China

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The objective of this scholarly endeavor is to critically evaluate the spatial distribution and underlying determinants of exemplary national fitness model districts (counties) within the framework of the national fitness initiative's progressive integration. The study endeavors to elucidate the mechanisms that facilitate the advancement of a sophisticated public fitness service system. This research leverages a robust analytical approach by employing ArcGIS spatial analysis techniques to systematically dissect the geospatial distribution patterns of the national fitness model districts (counties). The data utilized in this analysis is derived from the first and second batches of model districts (counties) as officially recognized by the General Administration of Sport. The study reveals a distinct spatial distribution characterized by a concentration of model districts (counties) in the economically vibrant southeastern regions, juxtaposed with a relative scarcity in the northwestern regions. The research identifies policy support, economic prosperity, and transportation infrastructure accessibility as the principal determinants influencing this spatial distribution. The findings underscore the significance of national and regional policies in shaping the establishment of these model districts (counties). Districts with robust economic underpinnings are more inclined to offer enhanced public fitness services, while areas with superior transportation networks are more conducive to nurturing the growth of these models. The study provides a scientific



underpinning for governmental policy formulation and contributes to the optimization of the national fitness public service framework.

**Key Words:** National Fitness Initiative, Spatial Analysis, Policy Influence, Economic Factors, Infrastructure Accessibility

Abstract ID: OP-SC230

## Research on the Recreation Behavior Model of National Scenic Areas in Taiwan

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This study aims to understand the potential relationships among participants' perceptions of recreational environments, recreational experiences, satisfaction levels, and post-recreational behaviors. The survey was conducted over five official event days: July 15, 16, 17, 23, and 24, 2022. It employed a quantitative research approach through on-site questionnaire surveys, with a total of 480 questionnaires distributed. After excluding 43 invalid responses, 437 valid questionnaires were retained (achieving a confidence level of 95% and a sampling error of 5%). Data collected were analyzed and processed using SPSS 20.0 for descriptive statistics, while structural equation modeling (SEM) was performed using LISREL 8.50 with Maximum Likelihood Estimation to estimate causal relationships among variables in the model. Results indicated that participants' perceptions of the recreational environment significantly and directly influenced recreational satisfaction ( $\gamma_{11} = 0.34$ ,  $p < 0.001$ ), which in turn significantly affected post-recreational behaviors ( $t = 0.08$ ,  $p < 0.001$ ). Similarly, participants' recreational experiences significantly and directly influenced recreational satisfaction ( $\gamma_{21} = 0.36$ ,  $p < 0.001$ ), subsequently impacting post-recreational behaviors ( $t = 0.06$ ,  $p < 0.001$ ). Additionally, the recreational environment significantly and directly influenced post-recreational behaviors ( $\gamma_{12} = 0.79$ ,  $p < 0.001$ ), as did recreational experiences ( $\gamma_{22} = 5.47$ ,  $p < 0.001$ ). Moreover, participants' recreational experiences had a significant direct effect on post-recreational behaviors ( $\beta_{12} = 8.05$ ,  $p < 0.001$ ). Based on empirical findings, this study presents an acceptable model that adequately explains and predicts the causal relationships among latent variables of participants. Furthermore, the study highlights the predominant use of non-motorized boat experiences in the event, garnering high participant ratings and support in overall planning and environmental sustainability. These findings provide valuable insights for management units in shaping future operational strategies.

**Keywords:** Recreational environment, Recreational experience, Recreation satisfaction, Post-recreation behavior

Abstract ID: OP-SC141

## A study on the influence of sports consumption decision of college student groups in commercial fitness clubs in

## the post-epidemic era of COVID-19- - based on the AHP model

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Accelerating the development of the sports industry and promoting sports consumption in order to comprehensively promote the development of consumption has become a visionary goal for China's national economy and social development. Based on the social background of the post epidemic era of COVID-19, this study mainly uses Analytic Hierarchy Process (AHP) to analyse the factors affecting the sports consumption decisions of college student groups in commercial fitness clubs in Dongguan City, so as to help the college student groups to make sports consumption decisions in a more scientific way. Analytic Hierarchy Process is mainly used to invite experts to assign scores ( weight value ) to the 15 factors affecting the sports consumption decisions of college student groups in Dongguan commercial fitness clubs, establish a judgement matrix, and calculate the eigenvectors and maximum eigenvalues of each sub-factor. The maximum eigenvalue is calculated to determine the degree of mutual influence between the sub-factors. In the post epidemic era of COVID-19, college students in Dongguan City prioritised "consumption" ( $D2=0.4735$ ), followed by "consumption with a wait-and-see attitude" ( $D1=0.3200$ ), and finally "no consumption" ( $D3=0.2211$ ), in the sport consumption decisions of commercial fitness clubs. The  $CR < 0.1$  for all single and total sorts indicates that the overall consistency of the judgement matrix is acceptable and all the eigenvector values pass the consistency test. This proves that the constructed judgement matrix is logical and the eigenvector values are valid and feasible as weight values. In the ranking of factors affecting the sports consumption decisions of college student groups in commercial fitness clubs in Dongguan City, economic factors are the first factor affecting consumption decisions, time factors are the second factor, self-needs are the third major factor, and other factors are the fourth major factor. The findings of this study are conducive to promoting the good development of sports consumption and the sports industry in the post epidemic era of COVID-19.

**Key Words:** post epidemic era of COVID 19, Analytic Hierarchy Process, commercial fitness clubs, sports consumption decision

Abstract ID: OP-OT021

## The Intersection and Integration of Confucian "Respect" Concept and Olympic Culture in the Post-Pandemic Era

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As a rare masterpiece of human society, the Olympics embodies profound Western philosophical ideas. With the rise of China in the post-pandemic era, the Olympics needs to absorb the philosophical concepts of Chinese philosophy in order to ensure

its sustainability and diversified development on a global scale. Scholars need to provide new answers. This study, using the research paradigm of post-Olympism, summarizes the philosophical experiences of the past integration of Olympics and the Confucian "respect" concept, focuses on the current intersection of Olympics and the Confucian "respect" concept, and explores the philosophical experiences of mutual learning between future Olympics and the Confucian "respect" concept. Thorough exploration will be conducted from these three aspects, with the aim of providing a long-term philosophical plan for the integration of the Olympic movement and Chinese culture. China, as the civilization with the longest history in human history, is also a civilizational country that integrates traditional society with modern society. It not only has cities like Beijing, Xi'an, Nanjing, Hangzhou, and Luoyang, which are rich in cultural heritage and modern infrastructure, but also faces challenges in terms of traditional and modern, urban and rural areas. The Confucian concept of "respect" in China can not only safeguard its own traditional culture but also actively promote the diverse development of different cultures in the world through the platform of the Olympics, thus achieving a transformation and revitalization of the Olympics in the land of China. Countless historical events have proven that the speed and level of development of a cultural form depend on its collision, exchange, and integration with other cultures. The more abundant the cultural resources it can acquire, the more rapid and healthy its development will be. New China, despite its numerous challenges, has managed to undergo an industrialization process that took Western developed countries several hundred years in just a few decades. The success of China's industrialization is deeply rooted in the Confucian cultural concept of "respect" for different civilizations. Just as Chinese industrial products have ventured beyond the country's borders, Confucian culture, when fused with Olympic spirit, will undoubtedly gain favor among people from different nations and ethnicities worldwide. As inheritors of Chinese culture, young Chinese individuals should not underestimate their own potential and should actively promote the integration of Confucian culture and Olympic culture, enabling Chinese culture to flourish and spread globally.

**Key Words:** Post-Olympis, Confucian Concept of "respect, Olympic Movement, Philosophical Concept

## SPORT PEDAGOGY & EXERCISE SCIENCE

Abstract ID: YIA-PE082

### Examining Critical Thinking and Satisfaction within a Competency-Based Physical Education Program

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This study investigated critical thinking and satisfaction within a competency-based physical education program among 9th-grade students at a junior high school in northern Taiwan. Two instant classes (N= 45) participated in this study and were divided into an experimental group and a control group. One class (N= 25) implemented the competency-based physical education program, while the control group followed the regular

physical education curriculum (N= 20). Both programs lasted three weeks, with two 45-minute sessions per week. The Critical Thinking Test - Level one was administered before and after the program, and a class satisfaction scale was given after each class for the experimental group. Results indicated significant post-test improvements in identifying assumptions, induction, interpretation, evaluation, and overall critical thinking scores in the experimental group. The experimental group also achieved higher scores in evaluation and overall post-tests compared to the control group. The average class satisfaction score for the experimental group was 4.5, indicating strong positive feedback on this innovative approach. These findings highlight the effectiveness of short-term competency-based physical education programs in enhancing critical thinking skills and overall student satisfaction, indicating that they could be advantageous for wider adoption in various educational contexts.

**Key Words:** educational interventions, instructional methods, pedagogical strategies

Abstract ID: YIA-PE144

### An experimental investigation on the impact of situational teaching methods on the physical fitness components of preschool children

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Preschool children are in a critical period of rapid physical development, and promoting their physical and mental health is of great importance. To enhance the physical fitness of preschool children, integrating multidisciplinary theories into physical education is a common educational approach. This study explored the impact of incorporating situational teaching (example: perform actions following a story, music, verbal guidance) methods into physical education on the physical fitness of preschool children. This study involved 32 preschool children from a kindergarten in Zhengzhou, who were randomly divided into an intervention group and a control group. The intervention group received situational teaching courses, while the control group followed the regular curriculum. Each session lasted 30 minutes, twice a week, for 12 weeks. Pre- and post-tests were conducted for all participants according to the China National Physical Fitness Test Standards. Data were analyzed using independent sample t-tests and paired sample t-tests. The results indicated that both boys and girls in the intervention group showed highly significant improvements ( $p < 0.01$ ) in speed, coordination, upper limb strength, balance, and lower limb strength after the intervention, while the improvement in flexibility was not significant. For boys, there were highly significant differences ( $p < 0.01$ ) between the intervention and control groups in speed, coordination, balance, and in lower limb strength ( $p < 0.05$ ). Meanwhile, for girls, there were highly significant differences ( $p < 0.01$ ) in coordination balance, and in speed and lower limb strength ( $p < 0.05$ ). Incorporating situational teaching methods into physical education for children is feasible. This work provides valuable references for the

development of preschool children's physical fitness through the different teaching methods in physical education.

**Key Words:** situational, teaching, children fitness, physical education

Abstract ID: YIA-PE195

### Preparing Teaching and Facilitating (TnLf) Activity for Gymnastic Skills: Challenges to Physical Education Teachers

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Physical education is one of the major subjects of Malaysia's primary school standard curriculum (KSSR). Malaysia also includes basic gymnastics in physical education as one of the branches of movement education that aims to provide exposure to students and becomes the basis for artistic gymnastics. Therefore, this paper discusses the constraints in preparing teaching and facilitating (TnLf) activity sessions in gymnastic skills. Methods: This is a case study that uses a qualitative method with a focus group discussion (FGD) approach. The selection of participants consisted of five new teachers and five experienced teachers who taught the physical education option. Note that two FGDs were conducted in two different online meetings and days. The findings of the study show that there are indeed constraints in emphasizing physical education in schools, such as limited school resources, nonoption, and new teachers not being able to meet the requirements of the Standard for Curriculum and Assessment Document, school management, and teachers lacking knowledge and skills. As an improvement, several suggestions have been proposed to overcome the challenges that have been identified. To ensure the effectiveness of physical education TnLf activity sessions in schools, all parties, including school management, teachers, and students, must clearly understand the challenge mechanism to ensure that students are more motivated to engage in the implementation of physical and physical activities and then adopt a healthy lifestyle throughout life.

**Key Words:** gymnastics, physical education, pedagogy, learning and facilitation, education

Abstract ID: YIA-ES039

### Comparison Between Flywheel Resistance Training And Horizontal Plyometrics On Sprinting Acceleration Performance

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The aim of this study was to examine the effects of horizontal plyometric training and flywheel resistance training on sprinting acceleration performance. Coaches and researchers usually

focus more on improving the maximum velocity of the sprint but not many looks into the acceleration phase of sprinting performance. A total of 22 sprinters (mean age: 20.77 ± 1.66, height: 171.96 ± 7.53 and weight: 66.45 ± 13.85) participated in the study and were divided into the flywheel resistance group (n =11) and horizontal plyometric group (n =11). Both groups underwent a six-week training based on their group on top of their regular training. A 20-meter was conducted for pre-test and post-test for both groups with the timing gates were placed at 0 meter, 10 meter, 15 meter, and 20 meter. Data analysis showed that there was a significant improvement in the 0 – 10 meter and 15 – 20 meter sections in sprinting acceleration for the flywheel group. As for the horizontal plyometric group, there was a significant improvement in the 10 – 15 meter and 15 – 20 meter sections in sprinting acceleration. This indicates that it is critical to consider varying training methods in improving sprinting acceleration prior to reaching maximum velocity for sprint events. Horizontal plyometrics aids in the generation of force for forward direction sprint while flywheel training helps in the transition phase of a sprinter into an upright position while reducing the braking forces that maintains the propulsion force in the acceleration phase which helps maintain speed during the initial 20 meters in a sprint event.

**Key Words:** Sprinting Acceleration, Flywheel, Horizontal Plyometric, Sprinters

Abstract ID: YIA-ES041

### Effects of Repeated Hypoxic Exposure with High Intensity Interval Cycling in Trained Athletes

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The aim of this study was to investigate the influence of re-acclimation to high intensity interval training (HIIT) with hypoxic conditions on trained athletes. In a quasi-experimental study design, seventeen male trained athletes (age = 26.7 ± 5.9 yrs; height = 172.1 ± 8.7 cm; weight = 70.3 ± 10.1 kg; BMI = 23.7 ± 3.1 kg/m<sup>2</sup>) divided into two groups based on previous hypoxic training exposure: (i) Experienced Group, EG (n=10): participants who have experienced repeated sprint hypoxia (RSH) training before, followed by a 4-week washout period after the training program; (ii) Non-experienced Group, NEG (n=7): participants who have no previous exposure to the RSH training, completed a 4-week (RSH training in moderate hypoxia (MH; FiO<sub>2</sub> = 16.5%). Jump performance, speed, anaerobic capacity, repeated sprint ability (RSA), and aerobic capacity were measured before and after the training. Aerobic capacity improved significantly in EG (p=.038) while the NEG showed significant improvement in measures (peak power: p=.017; average power: p=.002) and repeated sprint ability (RSA)

( $p=.011$ ) after RSH training. Jumping and sprinting performance did not vary after RSH training, regardless of group. There was no significant difference between EG and NEG in all variables except average power (PRE:  $p=.002$ ; POST:  $p=.024$ ). The first exposure increased anaerobic capacity, while the second exposure increased aerobic capacity. First exposure to the RSH training stimulus improved anaerobic capacity, but it did not further improve with repeated exposure. While a single block of RSH training has a minimal effect on aerobic capacity. In conclusion, a single block of 4-week RSH training is sufficient to improve anaerobic capacity, but not in jumping performance and speed. While repeated exposure of 4-weeks RSH training improved aerobic capacity but not anaerobic capacity.

**Key Words:** RSH, altitude, sprint, performance

Abstract ID: YIA-ES106

### Effects of Pineapple Juice on Hydration Level during Post Exercise Recovery

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Keeping the body hydrated post-exercise recovery to maintain the athlete's performance is crucial. The process of rehydration is replacing the fluid and electrolyte losses post-exercise. Therefore, this study aims to examine the effects of pineapple juice on hydration levels during post-exercise recovery. Nineteen males (mean $\pm$ s: age  $20.8 \pm 1.4$  years; height  $171 \pm 4.7$  cm; body weight  $67.9 \pm 8.4$  kg) were randomly assigned to drink either pineapple juice (PJ) or plain water (W). Subjects were required to run on the treadmill at 70%-80% maximum heart rate until achieved the targeted weight loss. At the intervals of 10 minutes during the trial, heart rate was recorded. Immediately after finishing the run, body weight, volume of urine output and urine specific gravity (USG) were recorded. Then, subjects were asked to consume either PJ or W at 150% replacement of their total body weight loss. They must finish the drink within 1-hour post run at the interval of 15-min. After they finished their drink, the 4-hour recovery timing was started. During the 4-hour recovery, body weight, volume of urine output and USG were recorded at 1-hour intervals and at the end of 4-hour. During the recovery phase, results showed that PJ has significantly retained fluid better than W. Rehydration assessment on volume of urine output showed a significantly different between PJ and W ( $p<0.001$ ). PJ (13957 ml) produced less volume of urine output compared to W (24070ml) ( $p<0.001$ ). This present study also showed that the USG dropped significantly during the 3rd hour of recovery session for both trials when compared to pre-exercise level ( $p<0.001$ ) and there is no interaction between both trials on USG ( $p>0.05$ ). Therefore, based on volume of urine output finding, this result indicated that pineapple juice has a beneficial effect on water retention during post-exercise recovery phase. Hence, this study concluded that pineapple juice, which is a local Malaysian product and non-carbonated, could be used as an alternative recovery sports drink for maintaining euhydration level post exercise.

**Key Words:** recovery, hydration, exercise, drink, urine output

## SPORT MEDICINE & ATHLETIC TRAINING & SPORT MANAGEMENT & OTHERS

Abstract ID: YIA-SM185

### Injury Survey of Japanese Electronic Sports Players Through Interviews

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Electronic sports are competitive sports that use video games. In the United States, injuries occurrence such as wrist and back pain among electronic sports players are a significant issue, highlighting the need for a support system involving medical professionals. For example, physical therapists and athletic trainers. However, research on injuries among Japanese electronic sports players is insufficient. This study aimed to verify the current state of injuries and support systems among electronic sports players in Japan and assist in evaluating injury prevention strategies. This study included 8 male professional electronic sports players in Japan (mean age  $29.4 \pm 4.6$  years). Online semi-structured interviews were conducted to determine if participants had experienced an injury, its parts. Further, we assessed whether they had visited a medical facility, their reasons for not visiting, and the presence and type of support received from medical professionals. The interviews were recorded, transcribed verbatim. We then created and analyzed a co-occurrence network diagram for support content using the text mining software KH Coder 3. Five participants (62.5%) had wrist, finger, neck, and lower back injuries. Four of the 5 participants had not sought medical attention, and all 4 indicated that their injuries were not severe enough to require medical examination. The 3 participants who reported having a support system had never experienced an injury. In the co-occurrence network diagram, "physical", "mental", and "nutrition" were extracted, and the 3 participants indicated that they had a system to receive advice on these topics from medical professionals. This study suggests the importance of providing electronic sports players with a physical, mental, and nutritional support system to prevent injuries. Therefore, we need to disseminate the importance of these support systems to electronic sports players and medical professionals.

**Key Words:** electronic sports, support systems, injury prevention, interview

Abstract ID: YIA-SM221

### Comparison of the effects of sports dance and traditional Chinese medicine exercises on the physical and mental qualities of college students in community groups

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This paper systematically evaluates the effects of sports dance (cha-cha, rumba, waltz, etc.) and traditional Chinese medicine health-preservation exercises (Ba Duan Jin, Yi Jin Jing, Tai Chi, etc.) on the physical and mental quality of college students, and puts forward reasonable exercise suggestions for promoting the physical and mental health of college students. Experimental research method, 60 college students aged 18-22 who participated in clubs were subjected to a 12-week experiment. The experimental group practiced sports dance routines (n=30, 3 classes/week, 100 minutes/time), and the control group practiced traditional Chinese medicine exercises (n=30, 3 classes/week, 100 minutes/time). Before the experiment, the physical function and mental health levels of the 60 subjects were measured and compared and analyzed. After the 12-week training, the relevant data of the 60 students were measured and analyzed again. In terms of physical function, the experimental group had significantly better reduction in circumference and body fat percentage than the control group, the control group had better balance ability than the experimental group, and there was little difference between the two groups in terms of heart rate, blood pressure and cardiopulmonary function. The control group was better than the experimental group in all indicators of mental health, and the experimental group was better than the control group in interpersonal relationships. Sports dance has rich body movements and fast rhythm, which is beneficial to improving cardiopulmonary function. The practice generally requires the cooperation of multiple people, which is helpful for interpersonal relationships among teammates. Traditional Chinese medicine health-preservation exercises are less intense, focusing on the coordination of breath and movement, and are more conducive to emotional and central nervous system regulation.

**Key Words:** sports dance, traditional Chinese medicine exercises, college students, physical function, mental health

Abstract ID: YIA-MG173

### **The Value Essence, Vision, and Strategy of High-Quality Development of Chinese Mass Water Sports**

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Against the backdrop of mass water sports emerging as a vital form of leisure and recreation and increasingly becoming a new focal point for Chinese national fitness. This study elucidates the value of high-quality development through expanding water sports consumption, accelerating resource mobility, enhancing public environmental awareness, deepening international cooperation, and meeting diverse public demands. This study utilizes a literature review and logical analysis to explore the value implications and developmental prospects of high-quality mass water sports. The vision for development is centered on the people, promoting a higher level of national fitness supply system construction, empowering mass sports through competitive sports, and integrating innovative "sport+" models to achieve high-quality development goals. Strategies include

refining top-level design, leveraging regional advantages, fostering green and blue water events, consolidating talent cultivation, and leveraging digital technology to ensure inclusive sharing of development outcomes. This research provides theoretical support and practical guidance for the sustainable development of mass water sports, playing an active role in building a modern socialist sports power. The study is a collaborative effort by Associate Professor Zhang Yiheng and Master Mao Lei, showcasing the depth and breadth of interdisciplinary research.

**Key Words:** Chinese Mass Water Sports, High Quality Development, Intrinsic Value, Development Vision, Development Strategies

Abstract ID: YIA-MG175

### **The integration of physical education and outdoor sports into the school curriculum under the perspective of holistic education: The value implications, exploration of challenges, and pathways for advancement**

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The purpose of this study is to elucidate the value implications of outdoor sports integration into schools under the concept of physical education and education integration, to explore the developmental challenges based on practical experience, and to propose pathways for advancement. This study first uses the literature method to comb through previous articles on sports "in school" to clarify the feasibility of outdoor sports in school, and secondly analyzes the advantages and disadvantages of existing cases to further clarify the advantages and problems of typical cases in practice. To provide references for further optimizing outdoor sports on campus, and finally, use logical analysis to discuss the special functions of outdoor sports in school to promote the physical, psychological and mental growth of young people, and further improve the value system of outdoor sports on campus. The findings indicate that promoting outdoor sports in schools can effectively meet students' diverse physical education needs, enrich the educational connotations of school sports, innovate teaching models in school physical education, and cultivate reserve talents for outdoor sports. However, the practical challenges include incomplete policy system guarantees, lack of institutional mechanisms, inconsistent teaching quality, urgent need for talent reserve improvement, insufficient facility construction, inadequate risk avoidance, limited social participation, and hindered integration processes. To advance the integration of outdoor sports into schools, it is suggested to strengthen government planning and policy support systems, integrate social sports resources for precise allocation of resource elements, clarify the rights and responsibilities of the main entities, and improve the talent cultivation system. Additionally, it is crucial to gather the efforts of multiple stakeholders to drive in-depth integration and development.

**Key Words:** Physical Education Integration, Outdoor Sports, Campus, School Sports

Abstract ID: YIA-MG176

## Temporal And Spatial Distribution Characteristics And Influencing Factors of Village "BA" Network Attention

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The purpose of this study is to summarize and analyze the evolution characteristics and influencing factors of village "BA" network attention, and to explore the problems of village "BA" in the spatial and temporal distribution pattern, in order to provide experience for related events. This study is based on the Baidu search index "BA" in the village from April to December 2023, using methods such as network attention and geospatial visual expression. The results show that the change of network attention generally shows an anti-N-type trend in time, and May and June are important inflection points for the anti-N-type distribution. From a spatial point of view, the attention of the "village BA" network gradually decreases from the east, middle and west. The Moran index is negative, spatially dispersed and not clustered. Locally, the Moran index is positive for most months and over a period of time, with a significant aggregation of high-high, low-high, and low-low. From the perspective of influencing factors, GDP level, regional population, number of universities, number of college students, and number of Internet broadband access users are the core factors that dominate the change of rural BA attention. The number of mobile Internet users, the proportion of the tertiary industry, and the proportion of urban population are important supporting factors. Excavate the characteristics of the event, innovate the event organization model, turn traffic into "retention", explore the path of IP to break the circle, integrate folk culture, optimize the utilization rate of venues, open up publicity channels, build an "event +" industrial chain, improve the specifications of the event, introduce talent resources, and inject new momentum into the healthy and standardized development of grassroots sports in China.

**Key Words:** Village BA, Internet attention, Spatial correlation, Geographic detector

Abstract ID: YIA-OT126

## THE EFFECTS OF A COMMERCIALY AVAILABLE ENERGY DRINK ON RESISTANCE TRAINING PERFORMANCE

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Energy drinks contain caffeine, taurine and vitamin-B, which are believed to enhance muscular performance. Caffeine and taurine help blunt fatigue and enhance muscle fiber recruitment. Vitamin-B boosts metabolism and reduces muscle inflammation,

collectively enhancing muscle performance. While usage of energy drinks in endurance sports is commonly studied, its effects on muscular strength, power, and endurance are less understood. This study aimed to investigate the effects of consuming commercially available energy drinks on resistance training performance. 40 healthy, resistance-trained men (age:  $23.4 \pm 2.2$  years; Body Mass Index:  $23 \pm 1.4$  kg/m<sup>2</sup>) participated in this double-blind, randomized placebo-controlled study. They were randomly assigned to either the experimental group consuming less-sugar Red Bull energy drink (ED), or the control group, which consumed an artificially sweetened placebo drink (PLA). Muscular strength, power, and endurance were assessed with 1-RM bench press, hand grip test, bench press max-repetitions at 70% 1-RM, and vertical jump. The assigned beverage was consumed three times a week with two days in between each session, for five weeks. Data were analyzed using paired t-tests and Two-Way Repeated Measures ANOVA. The ED and PLA groups showed significant increases in muscular endurance ( $p=0.0001$ ), bench press strength ( $p=0.0001$ ), and vertical jump (ED  $p=0.0001$  vs. PLA  $p=0.002$ ) after the five-week intervention. However, there was no significant difference ( $p=0.2$ ) in hand grip strength in either group after the intervention. When comparing between groups, the increase in muscular endurance was significantly higher in ED group compared to PLA group ( $p=0.005$ ). However, there were no significant differences between the two groups for bench press strength ( $p=0.3$ ), vertical jump performance ( $p=0.3$ ), or hand grip strength (left hand  $p=0.4$ ; right hand  $p=0.7$ ). The consumption of a commercially available energy drink did not enhance strength in resistance-trained men over a five-week period but did improve upper limb bench press muscular endurance.

**Key Words:** energy drink, resistance training, strength, power, muscle endurance

Abstract ID: YIA-OT187

## The Effect Of Specific Time-Efficient Warm-Up On 1RM Squat Performance

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This study examined the effect of a specific time-effective warm-up protocol on 1RM squat performance. Twenty trained male soccer players ( $n=20$ , with a mean age of  $18.99 \pm 0.75$  years) were recruited and randomly assigned to two crossover experimental protocols: the General Warm-up Protocol (GWP) and the Specific Warm-up Protocol (SWP). The same participants were used in both protocols to reduce variability in individual differences. After completing the prescribed warm-up protocols, the participants' 1RM squats were assessed. The data collected were analyzed using an Independent Sample T-Test to compare the variation in 1RM squat performance between the two groups. The results revealed a significant difference in 1RM squat performance between the GWP ( $90.8 \pm 6.74$  kg) and SWP

(112.5 ± 4.14 kg) groups ( $p = 0.045 < 0.05$ ). This indicates a significant difference in the effects of GWP and SWP on 1RM squat performance. There was a significant difference in time efficiency between the two warm-up protocols ( $p = 0.00 < 0.05$ ). The GWP showed a completion time of (318.90 ± 3.55 sec), while the SWP demonstrated a shorter completion time (106.85 ± 8.76 s). The results suggest that the specific warm-up protocol is a more efficient method for enhancing the outcomes of the 1RM squat performance. This investigation contributes valuable information about the implications of efficient warm-up protocols on 1RM squat performance. These findings also emphasize the potential benefits of using these specific and efficient warm-up protocols for practitioners, coaches, and athletes, which can significantly impact training outcomes and overall performance. Future research should explore the effectiveness of alternative warm-up protocols for various resistance training exercises and investigate how these exercises affect performance.

**Key Words:** Warm-up protocol, Specific warm-up, Time-efficient warm-up, 1RM squat, Soccer players

double-blinded randomized controlled trial with intention to treat analysis. Participants were randomly allocated to one of two groups days after cardiac surgery. Feasibility was defined as recruitment and adherence to exercise in the intervention group. Secondary outcomes were upper limb function as represented by the unsupported upper limb test(UULEX) and patient reported pain. Participants following median sternotomy completed UULEX and patients reported pain at baseline(pre-operatively), prior to discharge, at 4-6 weeks, and 3 months post-operatively. After recruitment and baseline testing, participants were randomised by an independent person using a computer-generated random number sequence (1 to 40) which allocated each participant to one of two groups that include standard care or intervention group. An independent and trained assessor (located off site) blinded to allocation conducted all measurement sessions. Data was collected from March 2020 till March 2022. 40 participants were recruited to participate in this study with 20 allocated to each group namely EiSPiRT and Standard care group. There were no withdrawals or dropouts in this study. Retention and adherence rate was at 79.9%. We found there were no statistically significant differences between-group differences with respect to upper limb function and patient reported pain except the height of UULEX at baseline period ( $p = 0.024$ ) and duration of UULEX during early post-operative period( $p = 0.032$ ). Within group differences for UL function and pain scale in both groups improving significantly over time ( $p < 0.05$ ). In this study, no sternal complication and sternal instability was found. There are 3 reported cases of graft harvest site hematoma, 1 in the intervention group and 2 in the control group (odd ratio: 0.474, 95%CI 0.039-5.688). This is the first randomized controlled trial to assess the safety and feasibility of EiSPiRT following median sternotomy within the early postoperative period using the UULEX and equipment to focus on the UL strength in the acute in-patient hospital setting. The implementation of EiSPiRT in the acute in-patient setting did not cause any adverse events. The protocol showed acceptability of patient recruitment, in the acute in-patient hospital setting with low attrition bias. Incremental upper limb resistance training is safe and feasible following cardiac surgery.

**Key Words:** Median sternotomy, Incremental resistance training, cardiac rehabilitation, upper limb exercise

## SPORT MEDICINE & ATHLETIC TRAINING

Abstract ID: OP-OT086

### Supervised Incremental Resistance Training Versus Standard Care Following Median Sternotomy - A Preliminary Analysis of Safety and Feasibility: A Randomized Controlled Trial

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Resistance training is a safe and effective intervention that facilitates physical and cognitive recovery following median sternotomy. However, there is a paucity of studies that have implemented incremental upper limb resistance training in the immediate acute postoperative period. Objectives: The main aim of this study was to examine the safety and feasibility of early-supervised incremental resistance training (EiSPiRT) in improving functional recovery following median sternotomy. This study forms a preliminary analysis of a phase II prospective,

Abstract ID: OP-SM193

### The Effectiveness of the Body CATALyst Program on Quality of Life in Individuals with Musculoskeletal Pain

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The study aimed to evaluate the impact of a 12-week Critical Alignment Therapy (CAT) based intervention, the Body CATALyst Program (BCP), on the quality of life (QOL) of individuals experiencing musculoskeletal pain (MSP). The study employed a quasi-experimental design with pre- and post-test assessments. Participants (n=65) were assigned to either the intervention group (n=36), receiving the BCP, or the control group (n=29). QOL was measured using the SF-36 Health Survey, assessing eight dimensions: Physical Functioning, Role

Limitations due to Physical Health, Role Limitations due to Emotional Problems, Energy/Fatigue, Emotional Well-Being, Social Functioning, Pain, and General Health. The BCP intervention led to statistically significant improvements in several QOL dimensions, particularly in physical functioning (mean increase of 12.08 points,  $p < .001$ ), role limitations due to physical health (mean increase of 14.69 points,  $p = 0.019$ ), energy/fatigue (mean increase of 13.33 points,  $p < .001$ ), emotional well-being (mean increase of 9.6 points,  $p < .001$ ), pain (mean increase of 16.94 points,  $p < .001$ ), and general health (mean increase of 22.08,  $p < .001$ ). No significant changes were observed in role limitations due to emotional problems or social functioning. The 12-week BCP intervention demonstrated promising results in enhancing the QOL of individuals with MSP, particularly in areas directly influenced by pain. The improvements in physical functioning, energy levels, and overall well-being suggest the potential of CAT-based interventions as a valuable tool for managing pain and improving QOL. Further research is warranted to explore the long-term effects and potential for integrating components that address emotional and social aspects of well-being.

**Key Words:** Critical Alignment Therapy, Body CATalist Program, musculoskeletal pain, quality of life, SF-36

Abstract ID: OP-SM166

### **Gender Differences in Vertical Jump Performance Among Elite Downhill Alpine Skiers**

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This study aims to investigate the differences between gender in vertical jump performance based on test results among downhill alpine skiing athletes.

The subjects of this study were 18 top-performing alpine skiers aged from 15 to 21 years old, including 8 males and 8 females. Measurements of height, weight, skeletal muscle mass, body fat, and BMI were made after season using Inbalance300; squat jump (SJ) and counter movement jump (CMJ) tests were conducted using Kistler three-dimensional force platform. Results of the study indicated significant gender differences in skeletal muscle mass, body fat, SJ maximum force ( $F_{max}$ ,  $p=0.000$ ), maximum horizontal force ( $F_{Sx_{max}}$ ,  $p=0.000$ ), maximum vertical force ( $F_{Dx_{max}}$ ,  $p=0.000$ ), flight time ( $p=0.008$ ), and jump height ( $p=0.007$ ) ( $p < 0.01$ ). Male athletes showed higher skeletal muscle mass (36.45%) and lower body fat percentage (20.81%) compared to female athletes. In the

CMJ test, only energy ( $p < 0.01$ ) showed significant differences between gender, with no other significant variations identified. Additionally, different age groups exhibited significant differences in the delay between maximum horizontal and vertical forces (Delay  $F_{max} Sx-Dx$ ,  $p < 0.05$ ), with older athletes showing zero delay between the left and right feet. In conclusion, this study reveals significant influences of gender on body composition and vertical jump performance among alpine skiers. The prominent advantage of male athletes in the SJ test is mainly due to their higher muscle mass, strength, lower body fat, and greater neuromuscular efficiency, which enhance their performance in the start and sprint phases of alpine skiing speed events. Some extra findings show age also plays an important role in the performance of alpine skiers. These findings will provide valuable insights for the training and selection of alpine skiing athletes.

**Key Words:** Gender Differences, Vertical Jump Performance, Downhill Alpine Skiing, Elite Athletes

Abstract ID: OP-OT200

### **A Study on the Current Situation of Physical Activity Among Senior Intellectuals in Universities and its Relationship with Physical Health**

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To study the relationship between physical activity level and physical health of senior intellectuals in colleges and universities, so as to provide scientific basis for improving physical activity level of senior intellectuals in colleges and universities and formulating specific measures in the future. The current situation of senior intellectuals' physical activity participation was evaluated by using an internationally accepted physical activity questionnaire. Their physical health status was comprehensively tested, including vital capacity test, step test, grip strength test, and sitting forward bend test. The correlation between physical activity level and physical fitness grade was explored. The physical activity level was analysed using SPSS software, and Pearson correlation analysis was performed on the results of the comprehensive evaluation of the physical fitness test grade and physical activity level. Senior intellectuals were mainly involved in low-intensity physical activities and moderate-intensity physical activities. According to the survey, 74 participants (48.7%) participated in low-intensity physical activities, while 42.8% and 8.5% participated in moderate- and high-intensity physical activities respectively. Two-sided significance level is  $P$  that is less than 0.01 for physical fitness test attainment level score and physical activity level score, and the Person correlation coefficient was 0.437, with a moderate positive correlation between the two. Senior intellectuals were predominantly engaged in low-intensity and moderate-intensity physical activities. Senior intellectuals engaged in high-intensity physical activities showed superior cardiovascular function, flexibility, muscle strength and reaction ability.



**Key Words:** University senior intellectuals, Physical activities, Physical health

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## EXERCISE SCIENCE & SPORT MANAGEMENT

Abstract ID: OP-ES229

### Relationships between Muscle Types and Individual Threshold Capacity of Dragon-Boat Rowers

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**Purpose:** This study aimed to explore muscle composition and individual threshold capacity among dragon-boat athletes across various physiological indicators. **Methods:** 16 collegiate, class A male dragon-boat players were recruited (age:  $21.4 \pm 0.5$  yrs, height:  $174.3 \pm 4.7$  cm, weight:  $74.7 \pm 3.7$  kg, training experience:  $6.8 \pm 2.7$  yrs). Each one had to wear Polar and collect blood sample before test (rest heart rate (rHR), lactic acid (LA), and NH<sub>3</sub>). After warming up and obtaining adequate rest, participants completed two tests using a rowing ergometer: a 75-meter and a 1000-meter, performed at maximum effort. Earlobe blood samples (20  $\mu$ L) were collected at the 3rd minute post-exercise. The two tests were separated by at least 20 minutes. The collected biological parameters (HR, power output (PO), LA, NH<sub>3</sub>) were analyzed using descriptive statistics and subjected to Pearson correlation analysis. The statistical significance level was set at  $\alpha = .05$ . **Results:** The average HR is  $188.6 \pm 6.9$  bpm, average PO is  $379.5 \pm 66.9$  watt, the maximum lactate metabolism rate is  $0.1 \pm 0$  mmol/l/s, average NH<sub>3</sub>-Index is  $1.1 \pm 0.4$ . The correlation coefficient between PO and LA is 0.353 ( $p > .05$ ), meaning there is a moderate positive correlation, but it is not statistically significant. The correlation between PO and HR ( $r = .11$ ), PO and NH<sub>3</sub>-Index ( $r = .02$ ), LA and NH<sub>3</sub>-Index ( $r = .01$ ) are almost no linear relationships and non-significance ( $p > .05$ ). To illustrate the characteristics, symptoms, and NH<sub>3</sub>-Index values of different quadrants in the four-quadrant ergometer. According to Schürmann et al. (1993), the NH<sub>3</sub> Index correlates with muscle fiber types suited to different exercise loads as follows:  $< 0.8$  as endurance athletes (Type-I fibers),  $0.8$  to  $1.2$  as moderate-intensity athletes (Type-IIC, Type-IIA fibers),  $> 1.2$  as high-intensity athletes (Type-IIB fibers). **Conclusions:** This classification based on NH<sub>3</sub>-Index values provides insights into the metabolic characteristics and suitability of athletes for various exercise intensities. The absence of significant correlations in this study may be due to insufficient sample size and individual variability. This result of this pilot study provides a valuable direction for renovating.

**Key words:** Dragon-Boat Athlete, Muscle Composition, Individual Threshold Capacity, Rowing Ergometer, NH<sub>3</sub>-Index

Abstract ID: OP-MG081

### Carbon footprint assessment of marathon participants

From the perspective of marathon participants, supported by life cycle, carbon footprint and other theories, this study explores the carbon emission intensity, key carbon emission sources, carbon emission structure, carbon footprint influencing factors and emission reduction potential of marathon participants during the course of a race. This study comprehensively used literature, focus group interviews, questionnaires and mathematical statistics to explore the carbon footprint of marathon event participants. According to the evaluation results of the selected events, the carbon footprint of the marathon participants in the selected events is about 95.57Kg carbon equivalent, and the estimated carbon footprint of the overall competition is about 3,484,904 Kg carbon equivalent. According to the evaluation results of this study, the per capita carbon intensity of participants in the selected event (2021 Zheng-kai International Marathon) is higher than the results presented by previous studies abroad. The reasons may be as follows: (1) The assessment data in the previous studies only included part of the carbon emissions of the assessed objects, and the assessment data in this study is relatively comprehensive. (2) The carbon footprint of the assessment object is closely related to its travel distance. (3) The assessment results were affected by the selected carbon emission factors. (4) The evaluation results are measured in different ways.

**Key Words:** Marathon Participants, Carbon footprint, Carbon reduction, Carbon neutral

Abstract ID: OP-OT049

### The Regulation and Development of Sports Law of the PRC on National Fitness

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Since the promulgation and implementation of the new Sports Law of PRC, public services for national fitness have been upgraded, and the country has expanded the supply of public welfare and basic sports services, promoted the equalization of basic public sports services, and focused on building a higher-level public service system for national fitness. In order to better introduce the public service system of national fitness in China, this study takes Sports Law texts as the research object and analyzes the operational mechanism and legal protection of China's public service of national fitness from multiple perspectives. The revised Sports Law sets a special chapter on national fitness, which has emphasized "Public Services for National Fitness", specifically stipulating the main systems and operational mechanisms of public services for national fitness. The article combines relevant regulations and revision ideas to

introduce the institutional supply, practical mechanism, and guarantee of public services for national fitness. Research suggestions: Accelerate the construction of a higher level public service system for national fitness, promote the comprehensive development of various elements of public service for national fitness, and actively respond to the new requirements and expectations of the people; Strengthen the supporting legislation of the Sports Law, accelerate the construction of systems and institutional, promote full cycle and full process supervision, and help achieve high-quality development of national fitness; Comprehensively evaluate the risks and influencing factors of supporting legislation, summarize the good practice of national fitness reform and institutional innovation achievements, effectively protect the rights and interests of stakeholders in national fitness, and ensure the high-quality, balanced, and full development of the public service system for national fitness.

**Key Words:** National Fitness, Public services, Institutional supply, Guarantee conditions

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Abstract ID: OP-OT203

### **Development and Validation of an Instrument to Assess Factors Influencing Herbal Supplement Consumption among University Athletes: A KAP and Health Belief Model Approach**

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Herbal supplements are widely consumed by athletes, but the underlying factors for this practice are not fully understood. This study aimed to adapt and validate a questionnaire to determine factors influencing consumption of herbal supplements among university athletes by integrating the Knowledge, Attitudes, and Practices (KAP) and Health Belief Model (HBM). The development of the initial set of survey questions, which includes KAP and HBM constructs related to herbal supplement consumption, was guided by a thorough review of existing literature and consultations with experts. The questionnaire was developed with seven constructs and 30 items (5 knowledge, 5 attitude, 5 perceived benefits, 6 perceived barriers, 3 self-efficacy, 5 practice and 1 cues to action). Content validity and face validity of the questionnaire were determined by 7 experts (CVI =0.9) and 30 university athletes, respectively. A test-retest reliability (n=38) was conducted (r=0.982, p=0.03). The construct validity was evaluated using exploratory factor analysis (EFA) on data collected. The Kaiser-Meyer-Olkin measure of sampling adequacy (KMO) was 0.796. The Cronbach's alpha for reliability of the knowledge, attitude, perceived benefits, perceived barriers, self-efficacy domains all showed acceptable values of > 0.8 (0.872, 0.840, 0.841, 0.830 and 0.889). This study successfully validated an instrument integrating KAP and HBM models for a comprehensive assessment of factors influencing herbal supplement consumption among university athletes. This validated instrument offers a valuable tool for future research to investigate the multifaceted influences on this behavior consuming herbal supplements.

**Key Words:** Herbal Supplement, KAP, Health Belief Model, Perceived Benefits, Perceived Barriers

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Abstract ID: OP-ES240

### **Effect of Badminton in Improving Heart Rate Variability of Overweight Recreational Badminton Players: A Randomized Control Trial**

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Overweight individuals often experience autonomic dysfunction, reflected in reduced heart rate variability (HRV), a marker of physical fitness and resilience to stress. While regular physical activity improves HRV, badminton's impact on HRV in overweight individuals has been underexplored. This study aimed to examine the effect of badminton training on HRV in overweight recreational players. A single-blind randomized control trial was conducted with 100 participants, stratified by age and body mass index (BMI). Baseline HRV, body fat percentage, waist-hip ratio, and BMI were recorded using the BioSignal Plux Explorer wireless device, skinfold callipers, measuring tape, and Body mass index was calculated with the help of height & weight measurements respectively. Participants were randomly assigned to an intervention group or control group. The intervention group engaged in one day of 60-90 minutes of moderate-intensity badminton and three days of 30-45 minutes of badminton paired with 30-45 minutes of gym-based resistance training. The control group performed one day of combined badminton and aerobic exercise, and three days of aerobic exercise paired with resistance training in gym. Paired t-tests and ANOVA were used to assess changes. The intervention group showed significant improvements in RMSSD ( $44.34 \pm 10.16$  to  $58.06 \pm 5.52$ ) and SDNN ( $50.94 \pm 10.80$  to  $62.16 \pm 5.92$ ), with greater improvements than the control group (RMSSD:  $p < 0.001$ ; SDNN:  $p < 0.001$ ). Both groups experienced significant reductions in BMI and total body fat percentage, with the intervention group showing greater changes (BMI:  $p < 0.001$ ; TBF%:  $p < 0.001$ ). The study concludes that structured badminton training significantly enhances HRV and body composition in overweight individuals.

**Keywords:** Heart Rate Variability, Recreational Sports, Overweight Individuals, Physical Activity, Body Metrics

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Abstract ID: OP-ES0169

### **Effects of a 6-Week Functional Movement Exercise Programme on Breast Cancer Patients: A Preliminary Investigation**

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This study aimed to examine the effects of a 6-week functional movement exercise programme on breast cancer patients. A total of 25 breast cancer patients (mean age:  $66.24 \pm 8.695$ , height(cm):  $154.40 \pm 3.819$  and weight(kg):  $62.27 \pm 11.155$ ) participated in the study. All patients underwent a six-week functional movement exercise programme once the draining tubes for the surgery were removed. Range of motion (abduction, anteflexion, and retroflexion) and isometric handgrip strength test was conducted for pre-test, post-drain, Week-3, and Week-6 (post-test) for all patients. Data analysis showed that for abduction, there was a significant difference at post-drain ( $119.52 \pm 30.403$ ) to Week 3 ( $152.92 \pm 15.516$ ) and Week 6 ( $158.48 \pm 24.609$ ) at  $p < 0.001$ . For anteflexion there was a significant difference at post-drain ( $121.52 \pm 22.593$ ) to Week 3 ( $154.84 \pm 12.931$ ) and Week 6 ( $161.72 \pm 10.656$ ) at  $p < 0.001$ . Furthermore, in retroflexion, there was a difference between post-drain ( $48.92 \pm 8.836$ ) to Week-3 ( $60.48 \pm 7.545$ ) and Week-6 ( $63.40 \pm 6.055$ ) at  $p < 0.001$ . As for isometric handgrip strength, there was a significant improvement at  $p < 0.001$  from post-drain ( $16.33 \pm 3.180$ ) to Week 3 ( $18.34 \pm 3.439$ ) and Week 6 ( $19.14 \pm 3.267$ ) at  $p < 0.001$  for 3 different timepoints. The functional movement exercise programme proved beneficial in returning patients' shoulder range of motion to normal or improved after surgery and increasing their muscular strength on their surgery side. Further investigation is needed by implementing a randomized control trial to investigate between the groups.

**Key Words:** Breast Cancer, Range of Motion, Handgrip Strength, Functional Movement Exercise Programme

(i.e., step-ups, partial curl-ups, push-ups, and sit-and-reach). These assessments were conducted three times: pre-intervention, post-intervention, and at a four-month post-intervention follow-up. The ANOVA results indicate significant improvements in physical fitness, with partial curl-ups increasing from a mean of 17.67 (SD = 5.50) at pre-test to 23.23 (SD = 5.24) post-test, and push-ups rising from 14.97 (SD = 6.06) to 31.00 (SD = 10.20) post-test, both with large effect sizes (Cohen's  $d = .28$  and  $.48$ , respectively). Psychological impact variables showed no significant changes, except for emotional symptoms, which had a small effect size (Cohen's  $d = .11$ ). Social well-being scores (CW-SWBS) significantly increased from a mean of 45.57 (SD = 11.50) at pre-test to 54.47 (SD = 7.87) at follow-up, with a notable effect size (Cohen's  $d = .21$ ). The results indicated a notable enhancement in physical fitness and social well-being, underscoring badminton's potential as a tool for holistic development. While the intervention showed limited immediate psychological benefits, it presents a significant stride toward integrating sports into strategies for nurturing well-rounded individuals. This research contributes to the existing literature by empirically testing BST in the context of sports intervention, offering insights into designing more effective programs for indigenous populations. This study seeks to highlight the pivotal role that structured physical activities, such as badminton, play in enhancing individual health measures and in creating nurturing environments that support the comprehensive growth of children within their ecological system. Furthermore, our findings advocate for a multidisciplinary approach to child well-being, proposing sports as a viable pathway to enriching the lives of indigenous communities.

**Keywords:** Shuttle Time program, body mass index, physical activity, Orang Asli, SEGAK Test

## SPORT AND EXERCISE PSYCHOLOGY

Abstract ID: OP-SP238

### The Effects of Primary School-Based Badminton on the Physical, Psychological, and Social Well-Being of Malaysian Indigenous Schoolchildren

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The purpose of this research was to examine the effects of badminton activities on the physical and mental health, and social well-being of indigenous children in Malaysia, framed within Bronfenbrenner's Bioecological Systems Theory (BST) utilizing a quasi-experimental design. The study included 30 schoolchildren (18 boys, 12 girls) aged between 8 and 11 years (mean age = 9.47; SD = 1.01) with no prior experience playing badminton, assessing their effects through the Strengths and Difficulties Questionnaire and the Children's Worlds Subjective Well-Being Scale (CW-SWBS), alongside physical fitness tests

Abstract ID: OP-SP239

### Wellbeing in Para-badminton Players: Sports and Psychosocial Factors at Play

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This study investigates the psychosocial factors influencing the wellbeing of para-badminton players, addressing a critical gap in understanding the unique experiences of para-athletes. Wellbeing is a multifaceted health outcome encompassing physical, psychological, social, and subjective dimensions. Although much research has focused on the general population and able-bodied athletes, the specific wellbeing of para-athletes remains underexplored. To uncover the challenges and benefits para-athletes encounter through sports participation, this study utilized an interpretive phenomenological analysis (IPA) approach. 18 para-badminton athletes who participated in the Para-Badminton Bahrain 2023 tournament were interviewed,

allowing researchers to organically capture and explore the meanings these athletes ascribe to their experiences. The IPA process involved a five- step method using Nvivo14 software to identify and categorize primary themes. Researchers began by thoroughly reading and rereading the interview transcripts to familiarize themselves with the content. Next, recurring patterns—both common and unique—were identified, offering insights into the participants' perspectives. These patterns were then coded and organized into preliminary themes, which were further clarified and labelled before being organized into overarching dimensions. The analysis revealed five primary themes: career pathways, motivations for participation, challenges, quality of life, and life with disabilities. The findings highlight that para-athletes face additional stressors, including issues related to self-acceptance, discrimination, and limited resources. However, they also benefit from supportive networks and opportunities for personal growth facilitated by sports. The study underscores the importance of developing tailored support strategies that consider the socio-cultural contexts influencing para-athletes' wellbeing. Understanding these factors is crucial for stakeholders to implement effective programs aimed at enhancing the overall quality of life for para- athletes.

**Key Words:** racket sports, adaptive sports, quality of life, qualitative study

Abstract ID: OP-SP038

### **The effects of mantra intervention on state anxiety and 100-m sprint performance in student athletes**

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This study investigates the impact of a mantra meditation intervention on 100-m sprint, competitive state anxiety, and norepinephrine in male student-sprinters. Thirty male sprinters (mean age: 16.5±0.5) with 100-m sprint time of ≤11.74s were assigned to the Mantra Meditation Intervention (MI, n=15) or Control (CON, n=15) group. Both groups completed a standardised 12-week training, with the MI group adding a 30-40 minutes of mantra meditation thrice weekly post-training. During the meditation, they chanted phrases that eased their negative emotions and brought inner peace. Measures taken at pre-intervention, week-6, and week-12 included 100-m sprint speed, CSAI-2 (cognitive, somatic, self-confidence), and norepinephrine levels. A two-way ANOVA with Tukey post-hoc ( $P < 0.05$ ) was used for statistical analysis. There was a significant group-time interaction on cognitive anxiety, self-confidence, and sports performance. In the MI group, cognitive anxiety and norepinephrine levels decreased significantly, somatic anxiety decreased, self-confidence increased, and 100-m sprint time improved. Compared to the CON group, the MI group exhibited significantly greater improvements in 100-m performance and lower cognitive anxiety with higher self-confidence at week-12. Twelve weeks of mantra meditation enhanced 100-meter performance in male athletes, with a concurrent increase in self-confidence and reduction in cognitive & somatic anxiety, and norepinephrine level.

**Key Words:** mantra meditation, 100 meters sprint, competitive state anxiety, norepinephrine

Abstract ID: OP-SP0222

### **Examining the Effects of Leisure Sport Activities for the Visually Impaired: Using Tai Chi and Walking as Examples**

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This study aims to explore the effects of Tai Chi and walking as leisure activities for individuals with visual impairments. The primary objective is to understand how tailored exercise routines can enhance physical and mental health, promote social interaction, and improve overall quality of life among the visually impaired. The research was conducted using a mixed-methods approach. For the quantitative part, a total of 40 visually impaired individuals were surveyed using a physical activity questionnaire to gather data on their exercise habits and perceived effort during the exercise. Additionally, 11 visually impaired participants were recruited to undergo a four-week exercise intervention involving Tai Chi and walking. Participants were divided into two groups: those performing concentrated exercise sessions and those engaging in divided exercise sessions. Participants' physical metrics such as weight, body fat percentage, and muscle mass were measured before and after the intervention. The qualitative component consisted of interviews with the participants and two experienced sports coaches for the intervention to gather insights into the motivations and challenges for maintaining exercise routines. The results indicated that participants showed improvements in physical health metrics, particularly in those who engaged in regular Tai Chi practice. The primary motivation for visually impaired individuals to maintain an exercise habit was health consciousness. Additionally, both Tai Chi and walking were found to be suitable and enjoyable activities for the visually impaired, with Tai Chi being especially beneficial for improving balance and muscle strength. Importantly, the study also revealed significant enhancements in participants' mental health and social interaction, with many reporting a stronger sense of camaraderie and connection in social settings. The study further highlighted the importance of fixed-point exercises, such as Tai Chi, as they were deemed safer and more manageable by both participants and coaches. Challenges in keeping exercise habits included the lack of accessible teaching materials tailored for visually impaired individuals and concerns about safety, especially in unfamiliar environments. The conclusion suggests that Tai Chi and walking are effective leisure activities for improving the physical, psychological, and social well-being of visually impaired individuals. However, to maximize participation and benefits, it is recommended that tailored exercise programs be developed with safety, accessibility and social interaction in mind, including specialized instructional materials and supportive environments. The involvement of trained sports coaches who understand the unique needs of visually impaired



individuals is crucial for the success of such programs. Future programs should focus on developing exercise content specifically for visually impaired individuals, offering training for sports coaches, and increasing the availability of accessible exercise spaces. Group-based activities and peer support are also important to sustain motivation and encourage long-term participation. This approach has the potential to improve not only physical fitness but also enhance social inclusion and quality of life for visually impaired individuals. Further research could focus on long-term effects and explore additional leisure activities that could be integrated into the daily lives of the visually impaired.

**Key Words:** Visually impaired, Tai Chi, walking, leisure activities, exercise intervention

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Abstract ID: OP-SP0109

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### The Relationship between College Students' Exercise Motivation and Physical Activities: Mediated by Self Efficacy and Moderated by Gender

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This study aims to assess the relationship between exercise motivation, exercise self-efficacy, and physical activity rating, as well as the role of exercise self-efficacy and gender in exercise motivation and physical activity rating. The subjects were 362 college students from Chinese universities, including 185 males and 177 females, aged  $19.0 \pm 0.8$  years. The research surveyed exercise motivation, self-efficacy, and physical activity rating scales. The results show significant differences between males and females in exercise motivation, self-efficacy and physical activity scores. Specifically, internal, institutional, and obedience motivation significantly correlate with exercise self-efficacy and physical activity score. Overall, the direct impact of ability motivation on physical activity score accounted for 40.7% of the total impact, while the mediating effect of exercise self-efficacy accounted for 59.3%. The result shows that self-efficacy is essential to exercise motivation and physical activity rating. Further analysis found that males' ability motivation accounted for 40.1% of the impact on physical activity scores. In comparison, the mediating role of self-efficacy accounted for 59.5%, which showed that self-efficacy was essential in improving male's physical activity levels. In contrast, female ability motivation accounted for 54.3% of the total effect, while the mediating effect of self-efficacy accounted for 45.7%. Although there is no significant difference in the path between the two groups, the results show that males need to strengthen their self-efficacy in physical exercise in the future. In contrast, females need to focus on improving their physical exercise ability and self-efficacy to improve their level of physical activity more effectively.

**Key Words:** Internal motivation, external motivation, gender differences, exercise self efficacy, physical activity

Abstract ID: OP-SP0215

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### Investigating the Multidimensional Motivation of Chinese Amateur Badminton Players

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This study aims to examine the multidimensional motivational characteristics of Chinese amateur badminton players. A total of 300 participants, comprising 180 males and 120 females, volunteered to complete the Badminton Participation Motivation Questionnaire. This questionnaire evaluates various factors influencing participation, including family, social, and escape factors. The results indicated that escape motivation is the primary factor for participation. Many participants highlighted the role of badminton in establishing and maintaining social relationships. Health and fitness motivation also emerged as significant, particularly among those focused on maintaining physical health. Social interaction motivation was found to be predominant among females, who are more inclined to build and sustain social relationships through badminton, whereas males are primarily motivated by competitive challenges and personal hobbies. Family factors play an important role in participation motivation, with many families engaging in badminton activities together to strengthen their relationships. This study provides valuable insights into the motivations of amateur badminton players in mainland China. Future research could explore additional factors, such as cultural background and economic status, to gain a deeper understanding of participation motivations.

**Key Words:** Amateur badminton players, motivation, family, practice, competition

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Abstract ID: OP-SP0220

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### The Impact of Cognitively Engaged Physical Exercise on Children's Executive Function

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From the perspective of cognitive engagement, this study employs a mediation effect analysis method to explore the relationship between tennis training, physical fitness, and executive function. A total of 121 children were selected as subjects, age(6-8), weight( $30.32 \pm 4.45$ kg), height( $119 \pm 6.9$ cm), divided into an experimental group (61) and a control group (60). The experimental group underwent tennis training three times a week, for 60 minutes each session, over 12 weeks, while the control group did not engage in any exercise intervention. Before and after the experiment, both groups were tested using the E-prime2.0 program for Flanker tasks, 1-back tasks, More-odd shifting tasks, and physical fitness assessments. After 12 weeks of tennis training, the children in the experimental group showed significant improvements in reaction times across all sub-

functions of executive function, with improvements significantly higher than those in the control group ( $p < 0.05$ ). For response accuracy in the refresh function, the experimental group exhibited significantly greater improvement than the control group ( $p < 0.05$ ), and the switching function reached a marginally significant level ( $p = 0.05$ ). Tennis training had a direct effect on the executive function of elementary school students. Regarding physical fitness, no differences were found between the experimental and control groups in endurance. However, the experimental group showed significantly greater improvements in strength, speed, agility, and flexibility than the control group ( $p < 0.05$ ). Twelve weeks of tennis training improved the physical fitness and executive function of elementary school students. Tennis training had a direct effect on executive function and also indirectly affected it through improvements in physical fitness.

**Key Words:** Elementary school students, Executive function, Physical fitness, Tennis

Abstract ID: OP-SP216

### Validation of the Athlete Burnout Questionnaire-Badminton for Chinese university student-athletes

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Athlete burnout is an important factor in many domains, it always affects athletes' training and competition performance. The Athlete Burnout Questionnaire (ABQ) is one of the established tools available to measure athlete burnout state. To date, there is no validated questionnaire to assess athlete burnout on badminton for Chinese university student-athletes. The purpose of this study is to validate the Chinese version of the Athlete Burnout Questionnaire-Badminton (C-ABQ-B) as a tool for assessing athlete burnout among Chinese university student-athletes. This study holds significant importance for understanding the relationship between athlete burnout and badminton performance among Chinese university student-athletes. We sampled 640 university student-athletes, aged 18 to 22 years, in five universities in Kunming City, Yunnan Province, China to complete the revised C-ABQ-B. Participants were selected through a multi-stage random sampling process. To ensure the accuracy of the translation, a team of bilingual researchers performed a comprehensive Chinese translation of the original ABQ. The translated C-ABQ-B was sent to the participants along with the socio-demographic questionnaire. SPSS 27.0 and MPlus 8.0 software were used to analyse the collected data and verify the factor structure. Data were analysed for factor structure validity by performing Confirmatory Factor Analysis (CFA). The results showed that the fit index was acceptable (RMSEA = 0.061, CFI = 0.973, TLI = 0.966), and a three-factor model containing 15 C-ABQ-B items had good measurement properties for athlete burnout. The research results contribute to understanding student-athletes' burnout among Chinese university badminton players and provide a valuable tool for future research and interventions. We suggest

future study may use C-ABQ-B to examine the relationship between student-athletes' burnout and badminton performance.

**Key Words:** Validation, burnout, optimal state of mind, sport psychology, badminton players

Abstract ID: OP-SP107

### Influence of basketball on the mental health of left-behind children in cities

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Urban left-behind children are a vulnerable group that is easily ignored compared with rural left-behind children. Compared with rural left-behind children with poor material conditions, urban life is diversified and the education environment is relatively good, which makes it easy for the public to ignore the growth of urban left-behind children. They have been separated from their parents for a long time, their psychological needs are difficult to meet during the growth process, and they are a scattered and easily ignored group of children in the city, and their mental health problems urgently need to be improved. This paper aims to improve the mental health of urban left-behind children, promote the better development and popularization of basketball, and provide a theoretical reference for the research on the mental health of urban left-behind children. This paper adopts the method of literature, interview, questionnaire, experiment, mathematical statistics and logical analysis. Taking 60 left-behind children from the No. 4 Primary School in Wuzhi County, Henan Province as the experimental object; Taking basketball and regular sports as experimental teaching content; The primary and secondary school students Mental Health Diagnostic Scale (MHT) was used as the main evaluation basis for this experiment. [Results] (1) Previous experimental studies have found that the mental health status of left-behind children is worse than that of non-left-behind children and left-behind children. Health problems need to be improved. (2) After 12 weeks of teaching experiment, it is found that basketball training plays an effective role in improving the mental health of left-behind children, and the improvement effect of basketball is more obvious than that of conventional sports activities. (3) After 12 weeks of basketball teaching experiment, it is found that basketball is helpful to improve the mental health level of left-behind children, and has a positive impact on multiple dimensions. Through the analysis of the experimental results, it is found that the mental health of the left-behind children in the city has played a positive role in improving the mental health level of the left-behind children, but in order to effectively improve the mental health level of the left-behind children, the curriculum design needs to be systematically optimized to prevent other factors from affecting the intervention effect.

**Key Words:** Basketball, Left Behind Children, Mental health

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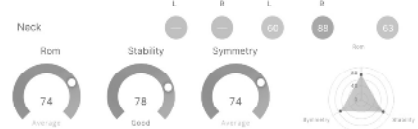
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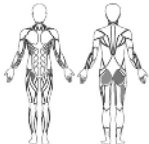


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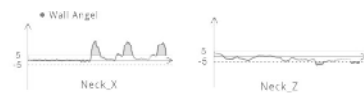
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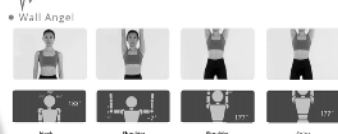
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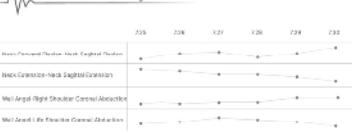
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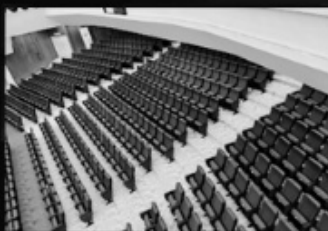
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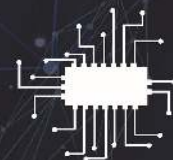
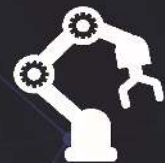


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