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KEYNOTE LECTURES

Keynote Lecture I

KL-I: Global and exotic research in exercise physiology beyond the border

Prof. Hirofumi Tanaka, Ph.D.
Department of Kinesiology and Health Education,
University of Texas at Austin, Texas, USA



Culture is an integral part of any society, and every community has its unique cultural heritage and tradition that sets them apart from the rest. Understanding and appreciating diverse cultures and people from different parts of the world can provide valuable insights for researchers in the field of exercise science. Adopting a global approach to research can offer fresh perspectives that challenge scientific dogma and uncover previously hidden physiological facts that traditional approaches may have missed. In this way, researchers can expand their knowledge base and develop a more comprehensive understanding of exercise science. The present lecture will showcase a range of research studies conducted by the presenter on various continents around the world. With the recent emphasis on diversity, equity, and inclusion (DEI) on college campuses, this topic is particularly relevant and timely. By embracing a global perspective and recognizing the importance of diversity, researchers and investigators in exercise science can enhance their research and contribute to a more inclusive and equitable world.

Keynote Lecture II

KL-II: New era of exercise medicine and psychology: acute exercise, cognitive function, and brain function



Prof. Yu-Kai Chang, Ph.D.
Department of Physical Education and Sport Sciences, National Taiwan Normal University, Taiwan

This presentation explores the emerging field of exercise psychology, with a focus on the acute effects of exercise on cognitive and brain function. Acute exercise, defined as a single session of physical activity, has been shown to positively influence both cognitive and brain function, marking it as a significant area of interest within exercise psychology. In this presentation, I will share the latest developments from three recent studies conducted in our laboratory. These studies highlight the following key aspects: a) Establishing a dose-response relationship between the duration of acute exercise and cognitive function; b) Examining the role of moderators that influence the connection between acute exercise and cognitive function; c) Investigating the potential mechanisms through which acute exercise impacts cognitive function, with a particular focus on neuroelectric changes in the brain. Additionally, I will discuss potential directions for future research and exploration in this evolving field. This presentation aims to contribute to the ongoing dialogue on the transformative impact of acute exercise on cognitive and brain function, shedding light on critical dimensions that warrant further investigation and understanding within exercise psychology.

Keynote Lecture III

KL-III: Human health and potential in a warming world

Assoc. Prof. Jason Lee Kai Wei, Ph.D.
Department of Physiology,
National University of Singapore, Singapore



Heat stress poses significant risks to athletes and exercisers, compromising performance, health, and safety, particularly in endurance sports in high-temperature environments. Vulnerable populations include endurance athletes, football players, tennis athletes, and individuals exercising outdoors or in poorly ventilated spaces. Heat-related illnesses, fluid imbalances, and cardiovascular strain are common health concerns, while decreased endurance, and increased risk of injury also occur. Effective solutions include physical conditioning, heat acclimatisation protocols, cooling, hydration and environmental modifications (e.g., shaded areas, air-conditioned spaces). Recognising heat stress as a critical concern in sports and exercise, coaches, trainers, and athletes must prioritise prevention measures, monitor weather conditions, schedule rest breaks, and provide access to medical care. By implementing proactive measures, athletes and exercisers can optimise performance, reduce injury risk, and ensure a safe and healthy exercise experience, ultimately enhancing overall well-being and athletic success. Learnings from sports heat management can also protect the public in a warming world. Collaborative research between sports medicine, public health,

and climate science experts can inform policy development and community engagement. Examples include cities incorporating heat management into urban planning and sports technology companies developing public-facing cooling solutions. By adapting these strategies, we can prevent heat-related illnesses, create resilient infrastructure, and promote sustainable living. This interdisciplinary approach can save lives and enhance community well-being.

Keynote Lecture IV

KL-IV: Positive approaches for physical activity promotion

Prof. Tanya Berry, Ph.D.
Faculty of Kinesiology, Sport, and Recreation,
University of Alberta, Canada



Affect (i.e., emotion such as happiness) is important when a person is deciding to be active. Affect often arises automatically – without conscious intention - and is independent of cognitive processes such as self -monitoring, goal-setting, and beliefs. Even though a person's affective response to a physical activity message can influence if a person does the behaviour (e.g., their immediate reaction is 'I hate exercise!'), most physical activity promotion assumes that people will take time to think about the message. Messages ask people to consider their attitudes, confidence, or intention, before deciding to be active (or not). Our work has compared the effects of common cognitive-based physical activity promotion messages to messages that target affect in populations such as older women with heart disease, people living with obesity, and the general public. This presentation will give an overview of our findings with suggestions on how to create positive messages. For example, a study with adults aged 35–65 years showed that automatic affective attitudes moderated the effects of health on motivation to exercise in a gym. In other work, women with heart disease said a typical physical activity promotion message was

‘nothing new’ but liked a happy, playful story about an older woman who exercised by dancing while cleaning the house. We also believe that weight loss should not be used to motivate people to be active because weight loss can trigger negative emotions such as shame. In our research, messages that included pictures of people with obesity and talked about the social or mental health benefits of being active were rated much more positively than messages that talked about weight loss. Overall, our findings show that physical activity messages that target positive emotions can be effective, but it is important not to assume that people will spend time thinking about what your message says.

Keynote Lecture V

KL-V: Diagnosis for Olympic athletes for speed and accuracy performance

Prof. Wen-Tzu Tang, Ph.D.
Graduate Institute of Athletics and Coaching Science, National Taiwan Sport University, Taiwan



This study examines the biomechanical and physiological factors influencing elite athletic performance, focusing on applications to Olympic athletes in Taiwan. Since 1997, Taiwan has systematically applied sports science to enhance national athletic performance, particularly in events like the Asian Games and the Olympics. The support system for athletes encompasses multiple disciplines, including psychology, biomechanics, physiology, nutrition, and sports medicine, aimed at optimizing performance through comprehensive diagnostics and individualized training strategies. Key areas of research include the biomechanics of archery, the physiological demands of taekwondo kicking techniques, and kinematic studies of golf swings. For instance, findings show that elite taekwondo athletes benefit from training tailored to various attack angles, enhancing both speed and adaptability. Similarly, in archery, muscle activation studies provide insights into effective stabilizing techniques during shooting phases, while for golfers, functional movement screenings reveal links between postural control and swing efficiency, particularly under conditions such as chronic low back pain or windy environments. Notably,

research on the biomechanics of the golf downswing highlights how history of injury impacts joint mechanics, suggesting specific adjustments for injury compensation. By integrating advanced diagnostic tools and real-time feedback systems, this body of work contributes to an evidence-based approach for improving athletic performance, addressing both physical conditioning and skill refinement. The findings underscore the need for customized training regimens that align with the unique biomechanical profiles and injury histories of elite athletes.

Keynote Lecture VI

KL-VI: Recovery strategies for performance enhancement

Assoc. Prof. Iñigo Mujika, Ph.D.
Faculty of Medicine and Nursing,
University of the Basque Country, Spain



Intensive training and congested match schedules can severely stress the musculoskeletal, nervous, immune and metabolic systems of athletes. The recovery process should be optimized to accelerate the restoration of performance capabilities, avoid excessive overload and limit the risk of injury. Each athlete, however, is likely to suffer different levels of stress, and recovery strategies should be tailored to the need of the individual athlete and carefully periodized throughout a season, as too much recovery and/or specific interventions might blunt training adaptation. Evidence-based guidelines should be adopted to ensure an evidence-informed approach to recovery. Some strategies such as nutrition-hydration, and sleep are effective in their ability to counteract the fatigue mechanisms. Moderate evidence supports cold-water immersion, compression garments, foam-rolling, and massage to enhance recovery. Other strategies (e.g. active recovery, psychological recovery, stretching) should be applied on an individual basis due to weak or lack of evidence. Individual fatigue levels depend on extrinsic and intrinsic factors, and objective and subjective markers of fatigue can help in the individualization of recovery.



SYMPOSIUM SESSIONS

S-I: Exercise Physiology



S-I-1: Nonpharmacological management of asthma-related issues in athletes

Prof. Timothy D. Mickleborough, Ph.D.
Department of Kinesiology, Indiana University, USA

Exercise-induced bronchoconstriction (EIB) presents a significant challenge for individuals with asthma and others experiencing bronchial hyperreactivity during physical activity. While pharmacological interventions like inhaled bronchodilators and corticosteroids are common, non-pharmacological management strategies have gained increasing attention due to their potential to reduce reliance on medication and improve long-term respiratory outcomes. Key approaches include the use of face masks, which humidify and warm inhaled air, reducing the cooling and drying effects that exacerbate bronchoconstriction. Pre-exercise high-intensity warm-ups have been shown to induce a refractory period, decreasing the likelihood of EIB during subsequent exercise. Inspiratory muscle training improves respiratory muscle strength and endurance, reducing the overall ventilatory demand and airway narrowing during exercise. Nutritional strategies, such as reducing dietary salt intake, have also been proposed to attenuate inflammation and airway hyperreactivity, with omega-3 fatty acids and antioxidant-rich diets offering further benefits. Together, these non-pharmacological methods provide a comprehensive, multi-faceted approach to managing EIB. When integrated into individualized treatment plans, they may optimize exercise tolerance and respiratory health in athletes and individuals prone to bronchoconstriction, while minimizing medication use and enhancing quality of life. This talk will review the evidence and provide recommendations for the use of nonpharmacologic strategies in the management of EIB.

S-I-2: Foot strengthening in older people

Prof. Hylton Menz, Ph.D.
School of Allied Health,
Human Services and Sport,
La Trobe University, Australia



This presentation will address four main questions: (i) do foot muscles get weaker as we age, (ii) if so, does this have functional consequences, (iii) can exercise strengthen foot muscles, and (iv) is foot exercise effective? In answering each of these questions, relevant research from the gerontology literature will be discussed, and the latter two questions will be addressed by presenting the findings of recent randomised trials. It is concluded that improving foot strength in older people has been relatively neglected but can be effective and has significant functional benefits. This presentation will also provide a summary of foot exercises which may be useful to incorporate in physical activity programs designed for older people.



S-I-3: Impacts of detraining and training cessation on glycemic control and metabolic health in older adults

Prof. Yi Hung Liao, Ph.D.
Department of Exercise and Health Sciences,
National Taipei University of Nursing
and Health Sciences, Taiwan

The impacts of detraining and training cessation on glycemic control and metabolic health in older adults are critical concerns due to the increasing prevalence of metabolic disorders in this population. Structured exercise programs, such as high-intensity interval training (HIIT), have been shown to significantly improve glycemic control, quality of life, and exercise motivation. However, the challenge lies in maintaining these benefits during periods of detraining. Evidence indicates that light physical activities, such as short bouts of yoga or walking, integrated into daily routines can help reduce fasting glucose levels and glycemic variability. Developing sustainable, home-based exercise programs that encourage regular, low-intensity physical activities is essential to counteract the adverse effects of prolonged sedentary behavior and training cessation. Future research should focus on designing long-term, feasible interventions tailored for older adults and enhancing adherence through behavioral strategies. Additionally, understanding the molecular mechanisms behind the benefits of breaking up sedentary behavior is crucial. In conclusion, strategic exercise interventions are essential for improving glycemic control and metabolic health in older adults, thereby significantly enhancing their health and well-being.



S-I-4: Innovative exercise intervention to enhance gait and balance in Parkinson's disease: new horizons and practical applications

Asst. Prof. Surasa Kongprasert, Ph.D.
Faculty of Sports Science,
Chulalongkorn University, Thailand

Parkinson's disease (PD) is a progressive neurodegenerative disorder that significantly impairs motor function, particularly gait and balance, leading to an increased risk of falls and a diminished quality of life. Traditional pharmacological treatments, while essential for managing symptoms, often fail to adequately address these motor deficits. Exercise has emerged as a complementary strategy to enhance mobility and stability in PD patients. Improving gait in individuals with PD requires innovative strategies that address common motor symptoms, such as rigidity, bradykinesia (slowness of movement), and postural instability. Exercise programs are typically structured around a multidimensional approach, incorporating balance training, gait re-education, and coordination exercises tailored to the specific needs of individuals with PD. By leveraging neuroplasticity, these programs aim to stimulate compensatory neural pathways, thereby improving motor control and reducing the risk of falls. Additionally, the integration of external cues and dual-task exercises has been shown to enhance cognitive-motor synergy, further contributing to improved balance and gait performance. Technological innovations,

such as robotic-assisted gait training (RAGT) and other assistive devices, have opened new frontiers in patient care. However, these advancements often come with high costs and limited accessibility, making them difficult to implement on a broad scale. To address these barriers, designing a home-based exercise device for PD offers a practical and convenient solution. Such a multi-cue walking mat, a laser belt can empower patients to manage their symptoms, improve mobility, and maintain strength from the comfort of their homes, providing an affordable and accessible alternative to high-tech options.

S-II-1: Importance-performance matrix analysis (IPMA) to evaluate runner experience in the trial running events



Assoc. Prof. Supawat Meeprom, Ph.D.
Faculty of Business Administration
and Accountancy, Khon Kaen University,
Thailand

As the global sport event industry surpassed previous growth records, trail running has developed the number of local communities, which are experiencing the economic, socio-cultural and environmental impact of modern-day hospitality and event business. Trail running may offers a unique challenge and experience for the event participants. The characteristics of trail running are running at elevation, fell running, the sport of running on hills, mountains or fells, and ultrarunning, which are not exclusively but often run off-road and always challenge greater than another running event and marathon. In other words, trail running refers to adventure sports in natural areas. Coates suggest that providing superior experience for even participants play a critical issue in running reputation. Drawing on experience economy perspective, the theory suggests that the various event features that stimulate individual engage and connect with the event environment in a personal way. The view of experience economy is categorised as four dimensions including entertainment and esthetic experiences which are indicated as passive, whereas educational and escapist dimensions are active. For example, when event participants perceived a positive experience toward the event offerings, they may contribute favorable behavioural outcomes such as engagement, co-creation experience, loyalty, and well-being. However, though important advances have been made in the experience economy model and

engagement with sport event literature, insight into the effect of four dimensions of experience economy in affecting engagement and their behavioral outcome remain limited. Therefore, prior research calls more research to explain the diverse role of four realms understanding event participant experience and shaping consumers' behaviors in sport event context.

Though experience and engagement are a crucial important research priority, the aims of this research need to verify the underlying experience economy dimensions of trial running event, propose a structural model to examine runner experience dimensions that affect their engagement and subsequent behavioural intent, and prioritise the experience dimensions of trial running event.

To investigate these issues, the data of this study were collected from people who had joined the trial running events in Thailand. 200 useable data were used to test the proposed conceptual model using the structural equation modelling with partial least squares (PLS-SEM) analysis. The results of this study found that entertainment experience and esthetics experience have strong and positive influences on runner engagement, which, in turn, affect behavioural responses such as revisit intention. Moreover, this study provides an insight knowledge related to experience dimensions by presenting an in-depth analysis through an importance–performance matrix analysis (IPMA). The findings of IPMA reveal experience dimensions that entertainment experience and escape experience should be given attention by concerned practitioners. The findings contribute to event experience literature and have pragmatic contribution for practitioners in the sport event industry. Besides structural relationship analysis among runner experience, engagement and behavioural intent, importance–performance map analysis with PLS-SEM estimator is utilised to identify which experience economy dimensions in the context of sport event are highly important and performed, thereby leading to an increase in favourable runners experience when interacting the event offerings.

S-II-2: Transformation and sustainability of the global sport industry

Asst. Prof. Nilmanee Sriboon, Ph.D.
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Thammasat University, Thailand



This research article aimed to investigate the current global movement in sports industry based on strategic management of transformation and sustainability. Regarding sports analytics by artificial intelligence (AI), digital transformation for global sports industrial improvement has visibly created immersive, interactive, and personalized sports spectator and consumer experiences. Exploring data on sports analytics found increased sports participation as an industrial demand for creativity, communal engaging experiences, and connection among fans worldwide. To adapt to global transformation and sustainability, the analytical investigation of strategic best practices from the North American sports industry was necessarily used as the explanation of the transformation in this article.

According to the report of Sport Industry Outlook 2024, the following practices were listed: 1) collecting data on fan preferences for obtaining key information about customers were used to adapt to service quality, satisfaction, and fan loyalty; 2) the rise of digital platforms in sports consumption of streaming services is the key of transforming how people watch sports. Leagues and teams need to adapt by creating their streaming platforms and partnering with streaming organizations; 3) popularity in women's sports ushered in record-breaking numbers in viewership, attendance, media rights and sponsorships in major sports;

4) the revolutionizing fans on exciting game day experience have seen more often fans arrive early to enjoy shopping, dining, and tailgating at the stadium complex's entertainment district, 5) boosting engagement with sports stories, documentaries, shows, and unscripted content related to leagues, teams, and athletes themselves are remarkable for active participating, 6) soccer on the rise in the US, due to three main factors of the rising prominence of US leagues, the growing accessibility to broadcasts and becoming the first billion-dollar franchise for having the greatest soccer player of all time Messi, and 7) the leading global brands of sport products and equipment have permanently relocated to developing countries with cheap labor workforce with facing social responsibility issues for decades. As a result, most of them have received recognition in several sustainability indexes, and investing in technologies and innovation to develop the working environment and sustainability.

In conclusion, sports industry regarding transformation and sustainability needs to have a new vision and strategy to enhance performance and redefine the boundaries themselves to embrace the advancements and challenges of tomorrow and sustainability. Sports leaders are required to have vision, innovation, and a steadfast commitment to excellence to ensure the transformation and sustainability of sports and proactive approaches.



S-II-3: Creating sustainability strategy in sports industry

Asst. Prof. Issadee Kutintara, Ph.D.
Faculty of Sports and Health Science,
Kasetsart University, Thailand

Sustainability is a key term emphasized by the United Nations through the Sustainable Development Goals. This philosophy is recently disseminated in various business practice in any industries including sport. However, we need to accept the virtue that nothing is permanent. All products have life cycle, introduction, growth, maturity and decline. External forces in today dynamic world keep attacking our organizations and business. To be sustain in this changing environment is to have a capability to adapt quickly and hopefully to extend our business performance. Decline is inevitable, but organization must have grit to encounter threats and get through difficult time and rebound to new revival.

The foremost component to sustain or extend sport business success start from human capital investment. In the new world, sport entrepreneur who can adapt quickly with changing environment will be industry leader. People who foresee trends or future threats can better prepare or adjust their business gameplan to cope with competition in market.

Second, sport manager should be able to position their business in the global value chain. In any sport business, there will be global industry leaders who control the game, hold transnational intellectual property like mega-events, brands, key sport contents.

Third, key big data and real time AI manipulation will be a typical decision support system for managers and also for consumer to serve their own needs by self-generate content. Without exploiting AI and ability to distinguish key information from big data will only hinder sport business from consumer interaction.

Last but not least, each sport content cannot survive without connecting with their sport ecosystem. Global professional sport content cannot forget grassroot and fundamental sports. High performance sport and professional sport will be intertwined and cannot neglect community and grassroot investment.

In summary, future and proactive oriented, adaptability, technological savvy, and positioning in global value chain are key strategies for extending sport business success. Hence, nothing is permanent and organization has to encounter decline at one point. The most important sustainable strategy would be ability to bounce back and revitalize their sport business.

S-II-4: Economic impact of mega sport events



Acting Sub Lt. Kaveepong Lertwachara, Ph.D.
Faculty of Sports Science,
Chulalongkorn University, Thailand

We have seen countries compete to host mega sport events like the Olympic Games, World cup, and many others. While emphasis is mostly on the direct benefits the host countries receive from hosting competitions, prior research has found benefits outside the games, including boosting economic activities, promoting health welfare, increasing publicity and showcasing the host nations. Aiming to contribute to the limited number of existing studies on the economic impact of mega sport events, our study empirically tests the impact of hosting mega sport events on foreign direct investment (FDI), which is one of the important economic indicators. We postulate that hosting a mega sport event provides the opportunity to present the host country's attractiveness to the world, and thus induces inward FDI to the host country. Our analyses cover major mega sport events at both the global and regional scales, including Summer and Winter Olympics, World cup soccer, UEFA Championship, and Asian Games, spanning the period from 1960 to 2018. By employing a well-known finance methodology called the event study, our empirical findings indicate significant benefits for hosting the Summer Olympics and World Cup soccer, especially after the year 2000.



S-III-1: Mental strategies for sport performance enhancement

Asst. Prof. Naruepon Vongjaturapat, Ph.D.
Faculty of Sport Sciences,
Burapha University, Thailand

Enhancing sports performance goes beyond physical training; mental tactics are essential for athletes to perform at their best. Athletes in Thailand, a nation rich in cultural traditions, are increasingly using psychological strategies to enhance performance. This session examines the mental techniques that Thai athletes frequently use, emphasizing the use of self-talk, goal-setting, mindfulness, visualization, arousal control, and resilience building. Deeply ingrained in Thailand's Buddhist tradition, mindfulness and meditation are commonly employed to improve attention, lower stress levels, and foster self-awareness. Athletes can improve their abilities and confidence by mentally practicing successful outcomes through visualization or mental imagery. A common strategy used by athletes to keep themselves motivated and in line with their long-term goals is goal setting. It helps athletes break down their ambitions into attainable steps. During trying times, affirmations and positive self-talk are used to boost confidence and counteract negative beliefs. Athletes can reach their ideal energy levels by using arousal regulation strategies like deep breathing

and muscle relaxation. This enables them to either relax before competition or get energized. The collectivist culture of Thailand influences social support and team cohesion, which further aid in mental preparation by promoting a strong feeling of community and teamwork. Before a competition, pre-performance routines—which frequently incorporate cultural customs—offer stability and serenity, and emotion control strategies support athletes in maintaining composure under duress. Thai athletes can increase their attention, resilience, and emotional control by incorporating these mental techniques into their training, which will ultimately improve their overall performance in the sport. Athletes, coaches, and parents have occasionally received these tactics and training in them, but perceptions toward the efficacy of the instruction as well as its frequency and efficiency remain unclear. Sport associations, associations, and sport psychologists must therefore collaborate and firmly acknowledge this as a gap that has to be filled.



S-III-2: Improving athletes' cognitive flexibility with dual-task training: what happen in brain executive function?

Asst. Prof. Benjapol Benjapalakorn, Ph.D.
Faculty of Sports Science,
Chulalongkorn University, Thailand

Cognitive flexibility is one of the most important attributes possessed by athletes. In sport situations, athletes would usually have to execute two, if not more, tasks concurrently. For example, while dribbling and controlling a basketball, a player would have to scan locations and movements of both teammates and opponents. Such condition requires a great deal of cognitive flexibility so that athletes could deal with both tasks and avoid suffering from task interferences and performance deterioration.

Originated from training protocol for patients with cognitive impairment, researchers repeatedly found that training with dual task paradigm being effective in enhancing athletes working memory skills and attentional control, while some also found improvement in combination of motor skills execution and situational awareness resulting in faster sensory processing, greater selective attention, better decision making, and shorter reaction time. With respect to those findings, cognitive-motor dual task training (CMDT) is widely adapted to enhance athletes' performance in several sports.

Prefrontal cortex (PFC) is a brain region highly involved in attention control, working memory, problem solving, response inhibition, emotional control, thought, judgement, motor planning, and decision making, all of which are crucial for sport performances. Brain activity across PFC region usually increases from resting just when individuals execute physical activity. However, cortical activities both in the frontopolar and the posterior PFC would be even greater in dual task training compared to resting and normal physical task. Greater activities in PFC, along which better connectivity to other regions, derived from dual task training is proposed as underlying mechanisms in improving executive function and attention control, transferring to enhanced motor responses.

Although remain mainly unclear, it was proposed that when performing two tasks at once the brain would be forced to optimize its resource allocation and learn to handle multiple demand efficiently. The effective allocation and division of brain resources could lead to greater attention control and cognitive flexibility, allowing athletes to be able to utilize their executive functions at the highest level and perform at their best performance.



S-III-3: Cognitive performances of talented-young soccer players: normative values and cognitive training

Atcharat Yongtawee, Ph.D.
Sport Development Officer, Senior Professional level Director of Research and Development section, Ministry of Tourism and Sports Thailand

Cognitive functioning has been revealed to play a major role in the athletic abilities of talented athletes. In order to understand the cognitive development during maturational stages of youth players, norm values of cognitive testing are needed. The purposes of this study were 1) to determine age- and playing position-specific norms for computerized-cognitive test battery in adolescent soccer players. 2) to suggest the cognitive training tool in sports.

Methods: The cognitive performance of 222 highly talented young soccer players was evaluated using the computerized-cognitive test battery for information processing (choice reaction time test), executive functioning (trail making test, flanker test, and design fluency test), and spatial ability (mental rotation test). Norms of cognitive tests were analyzed based on participants' age (aged 13–15 and 16–18 years) and playing positions (defenders, midfielders, and attackers). In a pilot study on cognitive training, a 3D multiple object tracking (Neurotracker) was employed in young soccer players aged 13–15 years.

Results: The results provide the normative data of each cognitive evaluation, including choice reaction time test, trail making test, flanker test, design fluency test, and mental rotation test, in relation to two age groups and three playing positions. Normative data could be useful for identifying highly talented players, the national team selection process, and for coaches and sports scientists to analyze players's strengths and weaknesses in order to design an optimal cognitive training program for enhancing athletic performance at the adolescent level. The results of the preliminary investigation showed positive improvement on particular cognitive skills after 4 weeks of intervention by the neurotracker. These findings may provide more understanding about the maturation of the adolescent brain and long-term sports participation, as well as an optional instrument, the neurotracker, that could be considered for cognitive enhancement in youth sports.



S-III-4: New era of exercise psychology and industry: multi-modal exercise and brain function

Distinguished Prof. Yu-Kai Chang, Ph.D.
Department of Physical Education and Sport Sciences, National Taiwan Normal University, Taiwan

This presentation explores the innovative domain of exercise psychology, emphasizing the effects of multi-modal exercise programs on brain function. Multi-modal exercise incorporates various components, including physical fitness, skill acquisition, social interaction, and mindfulness. Each of these elements has been demonstrated to enhance brain function, thereby offering a comprehensive approach to cognitive health. This newly developed exercise program meticulously integrates these diverse components, providing a holistic approach to both physical and cognitive well-being. Additionally, a certification process has been established to ensure the program's quality and effectiveness, complemented by the publication of a public science book aimed at disseminating these findings to a broader audience.

S-IV-1: Pre-exercise nutritional consideration for substrate metabolism and gastrointestinal permeability



Prof. Masashi Miyashita, Ph.D.
Faculty of Sport Sciences,
Waseda University, Japan

Consumption of low glycaemic index (GI) food has been shown to enhance fat oxidation during subsequent strenuous exercise in active young adults. However, limited studies have examined the influence of pre-exercise meal with different GI on substrate metabolism in untrained adults with various age and ethnicity groups. In addition, an acute bout of intense exercise has been shown to increase gastrointestinal permeability, attenuating barrier function which leads to an initial proinflammatory cascade. This causes gastrointestinal distress and impaired performance, in particular if exercise is vigorous and of longer duration in hot environments. Thus, appropriate pre-exercise dietary approach is necessary to consider for attenuating gastrointestinal permeability. However, little is known regarding the efficacy of nutritional supplement interventions on the attenuation of exercise-induced gastrointestinal permeability.

This presentation will present an overview of exercise and pre-nutritional intake, and address the potential roles of a low-GI meal and amino acids in response to exercise, including 1) the effects of pre-exercise high and low GI meals on substrate metabolism in inactive middle-aged and older women and 2) the effects of cystine and glutamine intake on gastrointestinal permeability, subjective fatigue and energy metabolism in young men.



S-IV-2: Caffeine, creatine, and glucose-electrolytes: which is/are limitation(s) during exercise tolerance in the heat

Assoc. Prof. Major Rungchai Chaunchaiyakul, Ph.D.
Asian Nutrition Society for Sports and Health (ANSSH)

Three main supplements are popularly consumed worldwide including caffeine, creatine and glucose-electrolytes drinks, which are particularly important on human performance under heat. The present review will be focused on acute ingested of the above from literatures and research being done by our groups. Caffeine acts at higher center and has no ergogenic effect and adversely induces higher core temperature. Thermogenic effect of caffeine, most likely, does not benefit to performance. Creatine supplement (25 g/d * 5 d) gives rise in 50% intramuscular CrP storage, with many side effects on muscle cramping, GI discomfort and heat intolerance. Chemical property of Creatine monohydrate, itself, will bring about fluid storage within muscle cells, and causes ECF hyperosmotic condition. It is suggested that hydration is more important than carbohydrate availability during exercise in the heat. It is quite common to observe sweating rate exceeding >1 L/hr during exercise in the heat. Thus, while exercising in the heat, fluid shifting between intramuscular and ECF plays critical on

tolerance. Even though blood flow redistributions from inactive tissues toward active tissues (skin and skeletal muscle) may be compensated. However, severe dehydration will increase competition in blood flow distribution between the skin and skeletal muscle from circulatory beds to meet their thermoregulatory and energetic demands. These will later deteriorate cardiovascular function. Our recent study indicated no cardiovascular and metabolic declined during exercise under extremely hot condition, where combinations of glucose-electrolytes, caffeine and creatine enhanced longer exercise duration.

S-IV-3: 2023 IOC Consensus statement on reds: what's the update?



Asst. Prof. Alisa Nana, Ph.D.
College of Sports Science and Technology,
Mahidol University, Thailand

Relative Energy Deficiency in Sport (REDs) remains a critical issue affecting athletes across various sporting disciplines. As awareness of REDs has grown, so too has the understanding of its far-reaching effects on performance, health, and long-term athletic development. The International Olympic Committee (IOC) has played a key role in driving forward this understanding, with updated consensus statements that aim to provide a clearer framework for identifying, managing, and preventing REDs in both elite and recreational athletes.

In this presentation, we will explore the latest updates outlined in the 2023 IOC Consensus Statement on REDs, focusing on the significant updates that have emerged since the previous guidelines. Topics will include refined diagnostic criteria, new insights into the physiological and psychological impacts of REDs, and emerging strategies for prevention and management. Particular emphasis will be placed on the broader implications of REDs beyond the female athlete, addressing the growing body of research on male athletes and those in weight-sensitive sports.

Attendees will gain a comprehensive understanding of the updated consensus, with practical takeaways for identifying at-risk athletes and implementing evidence-based interventions within their own practices. Whether you are a coach or a sports scientist, this session will provide crucial knowledge to help safeguard athletes' health while optimizing performance.

S-IV-4: Highly branched cyclic dextrin: an alternative ergogenic aid to enhance endurance exercise performance



Asst. Prof. Nattiporn Nokkeaw, Ph.D.
Faculty of Sports Science,
Chulalongkorn University, Thailand

It has been widely established that the ingestion of carbohydrate (CHO) pre-, during, and post-exercise can improve exercise performance in intense events that last longer than 60 to 90 minutes. CHO provides the most energy for high-intensity endurance exercise (85% to 100% VO2max), maintains blood glucose, and possibly spares endogenous glycogen stores. Consequently, CHO supplementation could be appropriate for athletes competing in endurance events. Fluid intake is a frequent way to deliver CHO before, during, and after exercise. However, the disadvantages of CHO-beverage are the monosaccharide and disaccharide composition, which makes the beverage very sweet, and the gastric emptying rate and intestinal absorption are too slow compared to other forms of CHO.

Highly branched cyclic dextrin (HBCD) is a glucose polymer synthesized through enzymatic cyclization by a branching enzyme (EC 2.4.1.18). HBCD has a high molecular weight and narrower molecular weight distribution than other maltodextrins. It is highly soluble in water, and the solution

is stable during storage. It does not have an unfavorable smell or taste in solution and has low osmotic pressure, which is a key factor in determining a beverage's gastric emptying rate. As a result of its low osmotic pressure, drinks containing HBCD have a shorter gastric emptying rate than glucose-based drinks and maltodextrin-based drinks and fewer gastrointestinal disorders in humans during exercise. Numerous studies show that drinks containing HBCD can improve endurance exercise performance by supplying glucose energy for extended periods, resulting in a longer time to exhaustion and a decreased rate of perceived exertion during high-intensity endurance exercise. Consequently, athletes who consume HBCD may exercise comfortably with delayed fatigue and a reduced rate of perceived exertion during high-intensity exercise.



S-V-1: Developing innovative technological approaches to promote "physical activity move more"

Prof. Hosung So, Ph.D.
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Physical inactivity is a significant global health concern, contributing to the rise of chronic diseases such as cardiovascular disease, diabetes, cancer, and mental health disorders. To address this issue aligned with the conference sub-theme of Promoting Health and Physical Activity in Super Smart Society 5.0, our ongoing efforts aim to promote physical activity through the development of technology-based resources that cater to individuals of all ages. Super Smart Society 5.0, also known as Society 5.0, is a concept introduced by the Japanese government as part of its strategy for economic and social transformation. It envisions a society where advanced technologies, such as artificial intelligence (AI), big data, the Internet of Things (IoT), robotics, and biotechnology, are seamlessly integrated into all aspects of life. The goal is to create a human-centered society that balances economic advancement with the resolution of social challenges, such as health promotion through innovative, technology-based solutions. The purpose of this presentation is to (a) highlight the urgent health challenges associated with physical inactivity and (b) introduce a technological booklet designed to encourage and support

physical activity in ways that are educational, engaging, and dynamic. Regular physical activity plays a crucial role in maintaining overall health. The World Health Organization (WHO, 2020) recommends that adults engage in 150-300 minutes of moderate-intensity aerobic physical activity or 75-150 minutes of vigorous-intensity aerobic activity per week, supplemented by muscle-strengthening exercises at least two days a week. These guidelines help reduce the risk of several chronic conditions, including heart disease, diabetes, and certain cancers. The American College of Sports Medicine (ACSM, 2021) reinforces this by suggesting a combination of aerobic and resistance training, along with flexibility and balance exercises for older adults to maintain mobility and reduce fall risk. The 2023 Physical Activity Guidelines for Americans provide further recommendations across age groups. Adults should engage in 150-300 minutes of moderate-intensity aerobic activity or 75-150 minutes of vigorous-intensity aerobic activity weekly, along with muscle-strengthening exercises two days a week. Children and adolescents (ages 6-17) should engage in at least 60 minutes of daily physical activity, incorporating aerobic, muscle-strengthening, and bone-strengthening activities at least three days a week. Older adults should follow similar guidelines but also include activities that improve balance, especially if at risk of falls. These guidelines emphasize that any physical activity is better than none, and even small amounts of exercise can lead to substantial health improvements. This presentation emphasizes the need for innovative, accessible resources to promote physical activity and illustrates how technology can serve as a key tool in addressing physical inactivity.

S-V-2: Why physical activity messages will likely still need a human touch



Prof. Tanya Berry, Ph.D.
Faculty of Kinesiology, Sport, and Recreation,
University of Alberta, Canada

Good messaging is important in physical activity promotion, but it is just one tool toward behaviour change. Reviews of existing research have shown that physical activity messages should be clear, simple, and direct – that is, understandable by most people. It is also important that they create positive emotions in people. Generative deep learning is artificial intelligence that draws on sources available to generate text and may be used for message creation. However, because of how tools such as CHAT GPT work, they come with problems such as recreating messages that are biased or not culturally appropriate. New physical activity promotion messages need to be creative to overcome these problems. This presentation will briefly present several physical activity messages created using CHAT GPT to illustrate why I believe humans, not generative deep learning tools, should create new and creative messages to promote physical activity. With any message created, research is needed to understand if it is effective in changing attitudes or intentions as one step toward increased physical activity.



S-V-3: Prevention of chronic disease from early childhood: utility of national physical fitness surveillance to inform decision making

Asst. Prof. Tetsuhiro Kidokoro, Ph.D.
Faculty of Sport Science,
Nippon Sport Science University, Japan

Although the clinical manifestations of chronic disease are typically not apparent until adulthood, the process of chronic disease (e.g., atherosclerosis) originates in childhood and progresses over the lifespan. Physical fitness in childhood and adolescence is a powerful marker of current and future health. Therefore, assessing fitness in childhood and adolescence can provide valuable information about the current and future health status of the population, which supports the significance of national physical fitness surveillance. In Japan, national fitness surveillance has been conducted annually since 1964, and it has been utilized for decision-making. A recent example of the usefulness of these fitness surveillance systems is their ability to evaluate the impact of the COVID-19 pandemic on health-related fitness. In my talk, I would like to discuss the importance and future directions of physical fitness research, with a particular focus on national physical fitness surveillance among children and adolescents.

S-V-4: Challenges of promoting physical activity in society 5.0 in Thai context

Asst. Prof. Raweewan Maphong, Ph.D.
Faculty of Sports Science,
Chulalongkorn University, Thailand



In the context of Society 5.0, which integrates advanced technologies with a human-centered approach, promoting physical activity in Thailand faces significant challenges. This presentation explores the barriers to physical activity, including increasing sedentary lifestyles driven by technology, inequitable access to recreational facilities, and the prevalence of misinformation regarding health behaviors. Furthermore, it addresses the psychological resistance to behavior change and highlights the impact of mental health issues on participation in physical activities.

With a substantial portion of the Thai population failing to meet recommended activity levels, there is an urgent need to identify effective strategies to overcome these obstacles. Proposed solutions include leveraging digital tools to enhance engagement, fostering community support systems, and advocating for policies that improve access to recreational spaces. By tailoring programs to the diverse needs of the population and addressing the unique cultural and social dynamics within Thailand, stakeholders can effectively promote physical activity. This discussion underscores the importance of adapting physical activity promotion strategies to the evolving landscape of Society 5.0, ultimately aiming to improve public health outcomes and enhance the overall well-being of the Thai population.



S-VI-1: The influence of functional movement on the movement efficiency of sport

Prof. Wen-Tzu Tang, Ph.D.
Graduate Institute of Athletics
and Coaching Science,
National Taiwan Sport University, Taiwan

This study examines the influence of functional movement on athletic movement efficiency, focusing on how screening tools and biomechanical assessments identify critical movement patterns essential for optimizing sports performance. Functional movement, characterized by an athlete's ability to execute fundamental tasks efficiently with minimal compensatory actions, is increasingly recognized as integral to competitive performance and injury prevention. Through Functional Movement Screening (FMS) assessments such as the overhead squat test, this research investigates the relationship between functional movement capacities and performance efficiency in sports, with a specific emphasis on lower-limb and core stability contributions.

The study evaluates correlations between FMS scores and movement efficiency in sports requiring precision in lower-extremity mechanics, such as baseball and golf. In baseball, analysis of pitchers' stride types and pelvis movement patterns reveals that distinct stride movements, like Drive-Down and Twist-Forward, result in different propulsion

strategies, influenced by functional capacities such as hip flexibility and core stability. These movement capacities are essential for generating optimal ground reaction forces and establishing effective kinetic chains, supporting more efficient and powerful pitching motions. In golf, the study contrasts athletes with chronic low back pain (CLBP) to those without, noting that functional movement limitations—measured through balance and core stability tests—impact swing mechanics and reduce movement efficiency. Findings indicate that golfers with CLBP demonstrate greater postural compensations, lower swing speeds, and shorter ball carry distances. These outcomes underscore the value of targeted training interventions to mitigate compensatory movements, enhance movement efficiency, and prevent further injury recurrence in athletes with functional movement restrictions.

The findings underscore the importance of functional movement screening in developing individualized training programs across sports. Functional assessments provide insights into specific movement efficiencies and highlight areas for targeted improvements, ultimately allowing athletes to enhance performance while reducing injury risk. By addressing inefficiencies identified through FMS, athletes may improve their competitive edge and potentially extend their athletic longevity. This study advocates for incorporating functional movement assessments and corrective exercises as foundational components within athletic training regimens, establishing functional movement as a cornerstone of effective sports conditioning.

S-VI-2: Demystifying the role of trunk rotation on the power of straight punches



Assoc. Prof. Chaipat Lawsirirat, Ph.D.
Faculty of Sports Science,
Chulalongkorn University, Thailand

Effective straight punches are crucial for success in boxing. Studies indicate that boxers who execute more straight punches tend to win more frequently. Although it is commonly believed that the power of a straight punch originates from ground reaction force (GRF), mechanical principles suggest a minimal or nonexistent relationship between punch power and GRF, as these forces are perpendicular with one another meaning that they are independent of one another. This presentation will explore the critical role of trunk rotation in converting vertical GRF into horizontal punching force. We will discuss how enhancing trunk rotational movements and strengthening associated muscles can significantly boost the power of a boxer's punch.



S-VI-3: Precision motion in swimming: motion analysis and wearable technologies from the pool to the lab

Asst. Prof. Phornpot Chainok, Ph.D.
Faculty of Sport Science, Burapha University, Thailand

Swimming performance is a complex process that necessitates the integration of diverse biomechanical, physiological, and technical elements. The article explores the complex dynamics of precise motion in swimming through a performance analysis methodology. Initially, it outlines the complicated details of integrative approaches that incorporate biomechanics, motion analysis, and real-time data to improve training and competition results. The role of the biomechanics analyst is analyzed, specifically regarding their support for coaches and athletes through the provision of comprehensive insights on swimming techniques, stroke efficiency, and performance data.

Next, the visualization and motion analysis tools used in swimming are discussed, highlighting how advanced software and hardware can capture and model an athlete's motion for both in-pool and laboratory environments. Wearable technologies, such as sensors and tracking devices, are also reviewed for their contribution to enhancing precision in swimming performance. These technologies allow for real-time feedback,

enabling athletes to adjust their technique during training sessions.

Finally, the article explores the application of explainable Artificial Intelligence (AI) in analyzing swimming performance. By leveraging AI models, analysts and coaches can gain deeper insights into the key factors that affect individual and team performance, with a focus on creating actionable, understandable strategies for improvement. This holistic approach to precision motion in swimming, combining biomechanics, wearable technology, and AI, offers a promising direction for future advancements in the aquatic sports particularly in “swimming”.

S-VI-4: Examining the sequencing of joint velocities during tennis serves

Asst. Prof. Parunchaya Jamkrajang, Ph.D.
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Mahidol University, Thailand



Tennis serve is a complex activity and considered the most important stroke in tennis. Previous studies in biomechanics on the tennis serve have explored various kinetic and kinematic aspects of body segments and racket head motion. A proximal-distal pattern of force generation is shaped by task, individual, and environmental constraints (Newell, 1986). Marshall and Elliott (2000) noted that the anatomical proximal-distal framework for analyzing the tennis serve is limited because it doesn't account for rotational forces, especially at the wrist. This study examined the sequencing of the euclidian and joint angular velocities when performing the tennis serve at the individual and group levels. 10 International level players (male and female) performed 40 maximum serves to 4 target locations. A motion capture system recorded the kinematics of the service action (200 Hz). A descriptive analysis demonstrated sequencing of the euclidian joint velocity and the joint angular velocity, changed as a function of service position. The results showed the same pattern from the highest to lowest order: peak wrist, elbow, shoulder, and hip for the euclidian joint velocity and joint

angular velocity, which underlines the sequencing is similar between the two frames of reference, and that the wrist movement is key in serving across all participants and conditions. The study provides insights into individual biomechanical patterns during serving, emphasizing the importance of joint-specific dynamics for optimizing sports performance.



S-VII-1: Elite sports performance in the heat

Assoc. Prof. Iñigo Mujika, Ph.D.
Faculty of Medicine and Nursing,
University of the Basque Country, Spain

High ambient temperature and humidity are associated with reduced capacity for endurance exercise. For instance, mathematical models and experimental studies indicate that metabolic heat production, heat storage and heat dissipation mechanisms are stressed during distance events in warm, humid environments. Heat stress could thus have caused or contributed to various widely reported counter performances of elite athletes at major international competitions, including for example marathon runners, triathletes and tennis players. Various strategies have been developed to limit the negative impact of heat stress on performance. Some of these strategies consist of precooling interventions to reduce an athlete's core temperature before and/or during competition. Heat acclimatization and optimal hydration practices are also important components of athletes' preparation for performance under thermal stress conditions.



S-VII-2: The post-exercise recovery continuum: when to heat and cool the muscle

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Mahidol University, Thailand

Recovery strategies have become commonplace to expedite recovery from strenuous or muscle damaging exercise and to facilitate muscle adaptive responses. While a number of recovery methods are available to athletes, the application of heating and cooling has particularly become widely adopted. The underpinning mechanism of cryotherapy (the application of cold) and thermotherapy (the application of heat) is related to changes in underlying muscle temperatures and associated blood flow. Although the mechanisms of facilitating recovery are now better understood, there remains some anecdotal confusion as to when to heat and cool the muscle. We now understand the context of applying heat and cold in respect to enhancing or dampening sought-after adaptations, however, it is less clear when to apply these strategies to expedite recovery when little time is available before next competitive fixture/bout. In this sense, focusing on the origin of fatigue may aid the athlete and sports practitioner in directing their attention to the appropriate recovery strategy. As fatigue can result from metabolic or mechanical pathways, it is feasible to suggest a periodized framework where both heating and cooling strategies are employed. Firstly, the application of cooling to reduce the proliferation of secondary muscle damage following the initial primary insult to the muscle, followed by heat application to promote the removal of metabolic byproducts or enhancement of substate resynthesis or cellular healing. This recently proposed framework may permit an individualized approach to recovery based on the training stress or load encountered.



S-VII-3: Repeated sprint train in hypoxia and angiogenesis

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Over the past years, repeated sprint training in hypoxia (RSH) has seen its popularity increase among team sports athletes. RSH has been shown to increase sea-level aerobic and anaerobic performance, also known as repeated sprint ability (RSA) compared with similar training in normoxia (RSN). At present, the exact mechanism underlying such performance gain remains unclear. Angiogenesis is a key physiological process that aids in promoting oxygen and nutrient delivery to active skeletal muscle. Of note, vascular endothelial growth factor (VEGF) is considered an important factor regulating angiogenesis. In the present study, we reported the link between RSA and serum hypoxia-inducing factor-1 α (HIF-1 α) and VEGF levels after RSH versus RSN in rugby sevens. This finding can shed some light on the potential mechanism behind the RSA performance gain produced by RSH and provide future research directions in the field of angiogenesis and altitude/hypoxic training.


LUNCHEON PRESENTATION

Luncheon Presentation

Hyperbaric oxygen therapy for athlete; from basic principle to clinical application

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Hyperbaric oxygen therapy (HBOT) is indicated in diving injuries and other medical problems. Benefit of increased systemic oxygenation under pressure is the principal mechanism of HBOT to treat such condition. Theoretically, this mechanism could have positive effect to athlete in promoting recovery after injuries and enhancing exercise performance. Although recent studies were unable to clinically demonstrate this advantage, many professional athletes and sports authorities also applied HBOT in their practice. This comprehensive review of published literature both basic science and clinical study mean to reveal the concept of HBOT use in athlete for proper and most beneficial application. Moreover, further study of HBOT in professional athlete during competitive events is required to prove positive albeit trivial effect in this special population. Minimal effect from this modality may be enough to act as a game changer in the final competition.


ORAL PRESENTATIONS



EXERCISE PHYSIOLOGY (EP)

EP-O-1

Mind-body exercise training-related change in the relationship between aerobic fitness and quality of life in elderly with hypertension

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Purpose To investigate of mind-body exercise training (MT) on physical fitness and quality of life (QoL), and its relationship between aerobic fitness and QoL in elderly with hypertension.

Methods Twenty-eight elderly (65.0 ± 0.87) with hypertension randomly categorized to MT group (n = 13) and control (CT) group (n = 15). The MT group performed exercise training for 30 min/day, 3 times a week for 12 weeks and CT group did not perform any type of training; instead, they maintained their normal daily activities throughout the study period. Before and after 12 weeks, the following data were obtained percentage of body fat, leg strength, flexibility, maximal oxygen consumption (VO_{2max}) and quality of life, and analyzed using repeated two-way ANOVA. Pearson's product correlation was calculated between physical fitness and QoL.

Results After 12 weeks, body fat and leg strength did not change in both groups. Flexibility and VO_{2max} increased in only MT groups ($P < .05$). Moreover, MT groups had more significantly ($P < .05$) improved in QoL than CT group after training. There was statistically significant small positive correlation between the VO_{2max} and the QoL ($r = 0.379$; $p = 0.047$). We found no significant correlation between the QoL and other variables.

Conclusion Mind-body exercise training-relate change in the relationship between aerobic fitness and quality of life in elderly with hypertension. Regular exercise has more effective improve physical fitness and quality of life in elderly with hypertension.

EP-O-2

Impacts of acute interval exercise on cardiovascular responses among adults with insufficient sleep

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Purpose The purpose of this study was to investigate the effects of acute intermittent exercise on cardiovascular regulatory responses in adults with or without insufficient sleep.

Methods Eighteen adult participants were divided into two groups: the insufficient sleep group (PS, n = 9, age: 5.50 ± 0.96 years; PSQI > 5, sleep duration < 7 hours) and the normal sleep group (RS, n = 9, age: 7.26 ± 0.93; PSQI ≤ 5, sleep duration > 7 hours). Participants performed an intermittent exercise session consisting of 42 minutes, with intensity alternating between 60% and 75% of their heart rate reserve. Blood pressure and vascular stiffness responses were measured immediately after the exercise, at 15 minutes, and 30 minutes post exercise.

Results Pulse wave velocity in the PS group was significantly higher than in the RS group. Blood pressure significantly decreased in both groups during post-exercise recovery, but there was no significant difference between the two groups ($p > .05$). The PS group exhibited a higher ankle-brachial index (ABI) and a greater area under the curve of ABI during post-exercise recovery ($p < .05$).

Conclusion This study found that insufficient sleep could lead to increased arterial stiffness, as indicated by elevated pulse wave velocity. Insufficient sleep may also impair vascular function regulation during post-exercise recovery.

EP-O-3

The effects of Thai dance training on neuromuscular function in diabetic peripheral neuropathy

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and
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Background/Purpose The aim of the study was to evaluate the effect of Thai dance training on neuromuscular function in Diabetic peripheral neuropathy (DPN)

Methods A randomized controlled trial with 38 participants (aged 60-75, MNSI > 2) was conducted. The intervention group (n = 19) underwent 12 weeks of Thai dance training (3 days/week), while the control group (n = 19) received home exercise advice. Ankle muscle strength was measured with a handheld dynamometer, and balance was evaluated using the Functional Reach Test (FRT) and the Balance Error Scoring System (BESS) with the Biodex Balance System.

Results After 12 weeks, the measures showed a significant time effect for dorsiflexion on the left side (DFLt) ($p = 0.009$) and right side (DFRt) ($p = 0.004$), as well as for plantar flexion on the left side (PFLt) and right side (PFRt) ($p < 0.001$), ankle inversion on the left side (ANLt) ($p = 0.004$), ankle eversion on the right side (AERt) ($p = 0.014$), FRT ($p = 0.009$), double-leg foam (DLFo) ($p < 0.001$), and total error of BESS (TErrBESS) ($p < 0.001$). There was a significant group effect for FRT ($p = 0.006$), double-leg firm (DLFi) ($p = 0.001$), DLFo ($p = 0.003$), single-leg firm (SLFi) ($p = 0.002$), and average BESS ($p < 0.001$). A significant group × time interaction effect was observed for PFLt ($p = 0.003$), FRT ($p = 0.004$), DLFo ($p = 0.009$), and average BESS ($p = 0.020$).

Conclusion Thai dance training significantly improved ankle strength and balance, especially in plantar and dorsiflexion, in individuals with DPN. These findings suggest that Thai dance may be an effective intervention to enhance neuromuscular function in this population.

EP-O-5

Effects of combined step-aerobic and resistance exercise on body composition, vascular function, and vasculature in post-menopausal women

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Background / Purpose After menopause, the decrease in estrogen hormones results in a decline in various physiological functions, with significant impacts on vascular health, structural integrity, muscle mass, and adipose tissue distribution. Aerobic exercise can help mitigate these issues by improving vascular function, enhancing structural integrity, and positively influencing adipose tissue distribution. Moreover, step-aerobic exercise not only improves vascular function but also boosts energy expenditure and enhances lower-limb muscle mass, offering a comprehensive approach to addressing these post-menopausal challenges. Therefore, combining step-aerobic exercise with upper-limb resistance training may offer additional benefits for postmenopausal women, particularly in improving factors related to cardiometabolic health. The aim of this study was to determine the effect of combined step-aerobic and resistance exercise on body composition, cardiovascular health in postmenopausal women.

Methods Eight healthy postmenopausal women (n = 8, average age 56 ± 1 years) were participated in the study. Participants were asked to perform step aerobics exercise at moderate to vigorous intensity (60-89%HRR) combined with resistance training using resistance band for 12-week (3 days per week). Participants performed three 60-minute session per week. Parameters of interest including baPWV, cIMT and muscle mass of arms and legs were measured before and after 12-training week. Differences between pre and post values were analyzed using a paired samples t-test.

Results After 12 weeks of combined exercise training program, there were a reduction in baPWV (1344&1256 cm/sec, $p < .001$), cIMT (0.52&0.47 mm, $p = .006$) and significant increased mass of lean tissue in both arm (2.8&2.9 kg, $p = .003$) and leg region (10.3&11.1 kg, $p < .001$).

Conclusion Our findings suggest that the combination of step-aerobic and resistance training program for 12 weeks could exert beneficial effect on vascular health and body composition especially arms and legs muscle mass in postmenopausal women.

EP-O-6

The relationship between aerobic capacity and cerebral pulsatility index in moderate and vigorous exercising male office workers

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Purpose The aim of this study was to compare aerobic capacity and cerebral blood flow velocity in moderate and vigorous exercising male office workers and to investigate the relationship between aerobic capacity and cerebral blood flow velocity and cerebral pulsatility index.

Methods In this cross-sectional study, 36 male office workers (40.58 ± 3.5 years) were recruited and divided into two groups: the moderate exercise group (ME, n = 16) and the vigorous exercise group (VE, n = 20). The mean activity levels were 2,793 and 4,371 MET-min/week in the ME and the VE group, respectively. The peak oxygen consumption (VO_2peak), middle cerebral artery blood velocity; peak systolic velocity (PSV), end-diastolic velocity (EDV), time-averaged mean velocity (TAMV) and pulsatility index (PI) were determined. The independent t-test and Pearson's correlation were employed as the analytical statistics.

Results The results demonstrated that there were no statistically significant differences between the two groups in PSV, EDV, and TAMV. The VE group exhibited lower PI and a higher VO_2peak than the ME group (all $p < 0.05$). A moderate negative correlation was observed between PI and VO_2peak ($r = -0.366$, $p = 0.028$).

Conclusion Regular aerobic exercise at high intensity can be beneficial on cerebral vascular function. Therefore, there was a correlation between higher aerobic capacity and lower middle cerebral artery pulsatility index in exercising male office workers.



SPORTS AND HEALTH POLICY, MANAGEMENTS & TOURISM

(SM)

SM-O-1

Global branding of South Korea's taekwondo: a literature review

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Background/Purpose Taekwondo serves as a powerful tool of soft power, effectively promoting Korean culture and enhancing international relations. By aligning Taekwondo with the global appeal of Hallyu, South Korea increases its cultural influence and fosters goodwill globally. As a symbol of peace and inspiration, Taekwondo connects communities and enhances its global brand presence. This literature review examines the strategies and efforts that have shaped Taekwondo into a well-recognized international sport and cultural brand.

Methods This qualitative study uses documentary analysis, reviewing literature and theoretical frameworks from sources like Google Scholar, ScienceDirect, and ProQuest, along with official websites like World Taekwondo and Kukkiwon. The research examines the processes of brand building, execution, and the promotion of the Taekwondo brand, with a focus on its global growth and its ties to the Korean Wave. The literature review spans sources from 2000 to the present, using key terms like "Taekwondo Branding," "Korean Wave," and "Global."

Results This study finds that Taekwondo' branding has been shaped by four main dimensions that have contributed to its international success. Firstly, the Cultural Dimension underscores its significance as a cultural emblem of South Korea, helping to create emotional bonds with its practitioners. Secondly, the Global Expansion Dimension emphasizes its growth through organizations like World Taekwondo (WT) and its acceptance into the Olympic Games, which has reinforced its global identity. Thirdly, the Media and Marketing Dimension focuses on how media, marketing, and educational efforts promoted its image and credibility. Lastly, the Personal Development and Cultural Diplomacy Dimension highlight Taekwondo's impact on personal growth, South Korean diplomacy, and the challenges it faces from other martial arts.

Conclusion The findings of the four dimensions contributing to the success of Taekwondo's branding could be used as a model for the global branding of other national martial arts, such as Thai boxing

The relationship between context conditions and elite sport policy in shaping international sporting success: insights from the Philippines

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Background/Purpose This study explores the intricate interrelation between context conditions and sport policy factors that shape elite sport system development in a lower-middle economic nation, using the Philippines as a case study. The research examines how various context conditions either facilitate or impede the effectiveness of elite sport policies, consequently affecting the country's international sporting success. The central research question is: How do context conditions enable or constrain the functioning of elite sport policies and influence international sporting success? Recognising that no one-size-fits-all blueprint exists for elite sport policies, this study enhances our understanding of how unique context conditions can be leveraged to optimise sport policies and boost a nation's potential for success on the global stage.

Methods A qualitative, case-oriented approach was employed, with interviews conducted with 16 elite sport stakeholders: six sport administrators, four coaches, and six athletes, representing seven National Sport Governing Bodies. Interview transcripts were analysed using thematic coding to understand how context conditions interact with elite sport policy factors (cf. De Bosscher et al., 2015), explaining how and why varied configurations of elements influence the country to achieve international sporting success.

Results The findings highlight the complex interrelation between context conditions and sport policy factors in shaping the Philippines' international sporting performance. Specific context conditions, including cultural, historical, legal structure, belief system, and transnational influences, were identified as factors that either facilitate or constrain elite sport development, contributing to the nation's mixed record of achievements and challenges in international competitions.

Conclusion This research emphasizes the importance of aligning sport policies with a nation's unique contextual characteristics. Rather than simply adopting best practices from other nations, this study suggests that countries can benefit from tailoring sport policies to their specific contextual characteristics for more efficient and effective elite sport development.

SM-O-4

The mirror has two faces: media representations of Filipino athletes and their alignment with humanistic values and competitive drives

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Background/Purpose Contemporary attention given to sports leads to an interesting discussion about how Filipino athletes are portrayed in the media and how they align with the humanistic values and competitive nature of this particular group. This study sought to refocus attention on the complex connection among media representations, humanistic principles, and competitive temper. Sports are frequently emphasized in the media as a teaching tool, reflecting humanistic values of harmony, diversity, and fair play. It also highlights the tremendous pressure that comes with competing at the highest level and the difficulties athletes endure to succeed.

Methods This study used a mixed research methodology and random convenience sampling to choose collegiate-level athletes who are currently competing in the Philippines. Media representations of Filipino athletes were measured by conducting a media content survey of targeted media channels through different digital platforms. A quantitative survey was used to determine how athletes feel about the humanistic and competitive ideas that are portrayed in the media. The humanistic values of participating collegiate athletes were evaluated using the Olympic Value Scale created by Koenigstorfer & Preuss (2018). Furthermore, Menesini et al. (2018)'s Competitive Attitude Scale (CAS) was utilized to evaluate athletes' competitive drives.

Results Using a thematic analysis method, the media content survey results indicate that most news media channels and programs feature stories of Filipino athletes in the context of winning and competitiveness. News features about humanistic values are occasionally presented. Self-assessment of Filipino athletes shows humanistic values were rated higher than competitive drives, although the two aspects were found to have a significant relationship yet only moderately associated.

Conclusion The study reveals that Filipino athletes are inadequately depicted in the media, with much focus on winnability and competitiveness. Whereas Filipino athletes recognize the importance of competitiveness in sports, they place higher regard for humanistic values in their sport participation.



EXERCISE AND SPORTS NUTRITION AND METABOLISM

(SN)

SN-O-1

An investigation into fluid intake, fluid balance, sweat composition of collegiate football athletes

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Background/Purpose There is a lack of research on Filipino collegiate athletes' hydration practices, fluid balance, and sweat composition. With limited training and academic time, conducting tests on-site to gain insight into these variables is preferable. This study is part of a larger project examining hydration in collegiate athletes across various sports.

Methods Twenty male (mean age = 20.45 years, height = 172.65 cm) and twenty female (mean age = 21.05 years, height = 157.83 cm) football players participated. Hydration status was measured using a digital refractometer (Atago, Japan). Body mass and fluid intake and urine output were measured before and after the game. Participants wore an adhesive sweat patch (Tegaderm, 3M) on the thigh during the game. The collected sweat was analyzed for sodium concentration using a portable device (Horiba Laquatwin Na + ion meter). The BEVQ-15 was used to determine beverage intake behavior.

Results Independent-Samples Mann-Whitney U Test revealed significant differences between males and females for USG (male = 1.017, female = 1.012, $p = .015$), whole body sweat sodium loss (male = 90.66 mmol, female = 45.5 mmol, $p = .000$), and sweat rate (male = 1.06 L/hr, female = 0.65 L/hr, $p = .000$). Beverage intake was similar for both groups (male = 2.04 L, female = 2.15 L, $p > .05$). Both groups were hydrated before the game. Whole-body sweat sodium loss was high for males and moderate for females. Average daily beverage intake was inadequate for both genders.

Conclusion The study provides valuable insight into the hydration practices of Filipino collegiate football players. Male athletes showed higher sweat rates and sodium losses, indicating the need for targeted interventions to optimize fluid balance, particularly in hot and humid conditions.

SN-O-2

The effect of structured physical activity and daily choco-malt milk supplementation on the physical fitness of Filipino children

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Background/Purpose Childhood is a crucial time for physical and mental development. Physical activity in children has been shown to promote physical health as well as improve self-esteem and social interaction.

Methods This study aimed to determine the effect of structured physical activity through a football camp participation and daily choco-malt milk (CMM) consumption on the physical fitness of Filipino children aged 8 to 12 years. The CMM powder was provided by a sponsor and the nutritional content will be presented in more detail. Participation in a football camp was selected as the physical activity intervention as it provided a structured physical activity in cooperation with football club. Furthermore, it guaranteed a novelty to the type of activity as football is not a popular sport in the country. The football camp was a twice-per-week after-school program that introduced the sport to beginners. The CMM powder was a 24-gram serving of powdered drink containing milk, cocoa, a special blend of malt, six vitamins and three minerals that provides at least 20% of the children's micronutrient reference values. One group (N = 21) received only the Football camp intervention (FB) while another group (N = 25) received Football camp intervention alongside daily CMM supplementation (FB + CMM). The intervention period was five weeks including pre- and post-testing.

Results In the FB group, there were no significant differences between pre- and post-test body fat, skeletal muscle, waist-hip ratio, grip strength, medicine ball push, 4x10-m shuttle run, and vertical jump. Overall, the football-only intervention did not have a significant effect on the fitness components. Factors that may influence the results include the small sample size and the relatively short duration of the intervention. In the FB + CMM group, there were no significant differences between pre- and post-test body fat, skeletal muscle, waist-hip ratio, grip strength, medicine ball push, and vertical jump. On the other hand, there was a significant improvement in the 4x10-m shuttle run with the effect size evaluated by Cohen's d indicating a moderate effect. It is also important to note that there was generally an upward trend, based on mean values, towards improvement in several fitness parameters tested, albeit not statistically significant.

Conclusion Overall, the interventions' impact was inconclusive with various confounding factors possibly influencing the outcomes. The researchers suggest a larger sample size, longer intervention period, and incorporating school-based activities as part of the intervention for better feasibility and monitoring.

SN-O-3

Caffeine ingestion on cardiovascular and metabolic profiles during and after acute progressive exercises

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Background/Purpose Caffeine have been most observed in Cardiovascular system (CVS) and metabolic function whereas were focus on effect results of caffeine or performance, very few studies have been investigated on acute and mechanism of ergogenic on cardiovascular and metabolic responses. The aim of the study is to find out effects of caffeine on cardiovascular responses and metabolic during progressive exercise at 45%-85% MHR and Time To Exhaustion (TTE) test

Method 11 healthy males (physical activity 3869 ± 1648 MET-min/week, caffeine consumed 116 ± 41 mg/day) participated in the study, randomized, double-blind trial and crossover designed with two interventions capsules of Caffeine 6 mgCAF/kgBW (CAF), Placebo (PLA) trials.

Results TTE was showed CAF longest more than PLA group ($p < .05$). Improved performance was associated with RER there was significant differences of each time after CAF ingestion ($p < .001$), Physiological Responses SV, CO, V'O2 consumption during progressive exercise there was significant differences ($p < .05$), however Cardiac Index not significant differences of each

Conclusions High dose of CAF showed improved performance in TTE and productive for metabolic function, enhanced physiological responses. Might be beneficial for increasing exercise capacity.

A comparison of body composition, nutrient intake, and physical activity of male recreational bodybuilders and healthy males

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Background/Purpose To compare the characteristics, nutrient intake, and physical activity of male recreational bodybuilders and healthy males.

Methods Twenty-four male participants aged 20 to 30 were divided into two groups: male recreational bodybuilders (MB; n = 12) and healthy males (HM; n = 12). Body composition was measured for each participant, and their food intake was tracked over three days. Additionally, participants completed the Global Physical Activity Questionnaire (GPAQ). Group comparisons were made using an independent t-test, with significant differences defined as $p < .05$

Results

1. The MB group had an average muscle mass of 79.32%, a resting metabolic rate of 1,589.41 calories higher, and an average body fat percentage of 17.30% lower than the HM group, all at the .05 significance level.

2. The MB group consumed 30.79% of their total calories from protein and had a total daily calorie intake of 2,018.09 calories higher than the HM group, also significant at the .05 level.

3. The MB group had a significantly higher total physical activity level, with an average of 4,762.50 MET-minutes per week more than the HM group, at the .05 significance level.

Conclusion The MB group had 1.13 times greater muscle mass and 0.68 times lower body fat than the HM group. Therefore, if the HM group intends to increase their muscle mass similar to recreational bodybuilders, they would need to consume 1.29 times more protein and a low-fat diet. In addition, the HM group had to enhance their physical activity level by 1.69 times to get a greater resting metabolic rate.

SN-O-5

The effect of choco malt milk supplementation (CMM) plus structured sports on elementary students' physical activity (PA), nutrition, and health-related quality of life (HRQoL)

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Background/Purpose Physical activity (PA) plays a critical role in children's physical and cognitive development, promoting strong bones, muscles, and overall health. Despite the recommendation for children aged 6-18 to engage in 60 minutes of moderate to vigorous physical activity (MVPA) daily, many fail to meet these guidelines, posing a global health concern. This study investigates the impact of chocomalt milk (CMM) supplementation on PA, nutritional status, and health-related quality of life (HRQoL) in schoolchildren. It specifically examines the effect of combining CMM with structured sports activities, such as football, on these outcomes.

Methods Sixty-three schoolchildren (mean age = 9.59 ± 1.23 years) participated in a quasi-experimental study. They were divided into three groups: football + CMM (FB + CMM), football only (FB), and a control group (CON). PA was monitored using activity trackers over four weeks, while pre- and post-intervention assessments of nutrition and HRQoL were conducted through a 24-hour food recall and the KIDSCREEN-27 and CLASS (Children's Leisure Activities Study Survey) questionnaires, respectively. Data analysis employed repeated measures ANOVA and paired t-tests to assess changes within and between groups.

Results No significant differences in step count were observed between ($p = 0.50$) and within groups ($p = 0.543$). However, a significant decrease in caloric expenditure was found for the CON group ($p = 0.023$) and the FB + CMM group ($p = 0.018$). Nutritional status assessment indicated no major changes, except for a significant increase in vitamin C intake for the FB group. HRQoL findings showed that the FB group scored higher in psychological well-being than other groups ($p = 0.021$).

Conclusion While MVPA engagement declined overall, results suggest combining CMM supplementation with structured sports may help sustain physical activity engagement and improve psychological well-being in children. Future research should explore the long-term effects of CMM plus sports participation on children's health and development.



HEALTH PROMOTION / PHYSICAL ACTIVITY AND WELLNESS

(HP)

The sexual health literacy of the underprivileged children and youth

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Purpose To investigate the sexual health literacy and the need for sexual health information among underprivileged children and youth.

Methods The researchers used a qualitative method to study the sexual health literacy and the need for sexual health information among underprivileged children and youth. The study included in-depth interviews with 11 underprivileged children and youth studying at Rajprachanukroh 58 School, Nonthaburi Province, as the primary data source. Additionally, a focus group discussion was conducted with 10 teachers from Rajprachanukroh 58 School, Nonthaburi Province, as a supplementary data source. The objective was to understand the sexual health literacy and the need for sexual health information among children and youth from the perspectives of both the students and the teachers responsible for their care.

Results The study revealed that the sexual health literacy of underprivileged children and youth is low. They have inadequate access to and comprehension of accurate information. Moreover, they lack the skills to inquire about and make informed decisions regarding the selection of information for their use. In terms of their need for sexual health information, the study found that underprivileged children and youth are most interested in learning more about pregnancy prevention and the prevention of sexually transmitted diseases. The second most desired topic is proper sexual conduct.

Conclusion Underprivileged children and youth possess a low level of sexual health literacy. They prioritize information about pregnancy prevention and the prevention of sexually transmitted diseases resulting from sexual activity.

HP-O-2

Association between pre-retirement occupations and exercise behavior among retirees from white-collar occupations

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Background/Purpose Retirees need more leisure-time physical activity, such as exercise, to compensate for reduced occupational physical activity after retirement. Previous research has identified that exercise behaviors among retirees may be influenced by the occupations performed before retirement. This study compares the exercise behaviors of retired white-collar workers from managerial and non-managerial positions.

Methods The data were collected through questionnaire surveys from September 1st to October 13th, 2023. The study population was 67 retirees from white-collar occupations aged over 60 enrolling in the citizen's college in Japan. Participants reported their pre-retirement occupations and exercise behavior in the past year. The pre-retirement occupation was categorized as i) managerial position, ii) non-managerial position. Exercise behaviors include 1) exercise habits, 2) exercise days per week, and 3) exercise duration per week.

Results 55.2% (n = 37) of the subject population retired from managerial positions. After controlling for gender, age, and education, retirees from managerial positions (median: 5.33 h/week) exercised more hours per week than those who retired from non-managerial positions (median: 2.97 h/week). The proportion of those who have an exercise habit and those who exercise at least one day per week among retirees from managerial positions (81.1%, 91.9%, respectively) is higher than that of retirees from non-managerial positions (63.3%, 80.0%, respectively), although no significant difference was observed.

Conclusion These findings demonstrated that retirees from managerial positions exercise longer than those retiring from non-managerial positions. Future research should analyze the impact of a broader range of pre-retirement occupation types on exercise behavior among retirees.

The acute effects of different Tiuna massage durations on work-related muscle pain from office syndrome in office worker

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Background/Purpose Tuina, a traditional Chinese therapeutic massage, is an external therapy. Tuina can relax the muscles and tendons, relieve pain, and promote blood circulation. However, there are no studies on the effects of Tuina with different durations of massage. This study, therefore, aims to examine and compare the acute effects of Tuina with different durations on muscle pain and neck movement in office workers with office syndrome.

Methods Sixty-four office workers with upper trapezius muscle pain due to office syndrome, aged 25-45 years, were divided into two groups of 32 each. Participants received Tuina massage for either 10 minutes or 20 minutes, with conditions assigned randomly. The study used a crossover design with a 7-day washout period. Pain perception was measured using the Numerical Rating Scale (NRS), Pressure Pain Threshold (PPT) on both sides of the upper trapezius, and Cervical Range of Motion (CROM). Data were analyzed using mean, standard deviation, and paired sample t-tests.

Results The acute effects of Tuina massage with different durations on muscle pain and neck movement were compared pre- and post-experiment. The study found a significant decrease in the Numerical Rating Scale (NRS) and significant increases in Pressure Pain Threshold (PPT) and Cervical Range of Motion (CROM). Tuina for 20 minutes resulted in a more substantial reduction in NRS compared to 10 minutes, though there were no significant differences in PPT and CROM between the two durations.

Conclusion Tuina massage for 10 minutes effectively reduced upper trapezius muscle pain, leading to increased muscle relaxation, flexibility, and improved neck movement. However, a longer duration of Tuina (20 minutes) resulted in more significant pain reduction. Therefore, Tuina massage effectively alleviates muscle pain associated with office syndrome.

Correlates of physical activity among preadolescent Filipinos

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Background/Purpose A resounding call for more contemporary research on the correlates of physical activity in low and middle-income countries has bee documented over the years. It was therefore the aim of this study to examine the correlates of physical activiy in terms of endurance, body mass index and motivation.

Methods Study participants involved 257 students, ranging from 9 to 11 years old preadolescent Filipinos. The physical activity levels were determined by the Physical Activity Questionnaire for Children (PAQ-C), while the cardiorespiratory endurance was assessed by a 3-minute step test. A body mass index (BMI) was calculated and classified using the World Health Organization criteria. Both Behavioral Regulation in Exercise Questionnaire (BREQ) and the PAQ-C were used to measure motivation in physical activities. An interview was also conducted for data triangulation.

Results This research yielded the following results: First, endurance (x1) had no direct positive effect on physical activity (y) (β = -.069). Second, BMI (x2) had no direct positive effect on Physical activity (y) (β = .023). Third, motivation (x3) had a direct positive effect on physical activity (y) (β = .237). Next, endurance (x1) had no direct positive effect on motivation (x3) (β = -.116). Subsequently, BMI (x2) had a direct negative effect on motivation (x3) (β = -.301). Finally, endurance (x1) had a direct positive effect on BMI (x2) (β = .515). Endurance-BMI was considered the most remarkable relationship, garnering the highest standard estimate score of .515. The results also showed that BMI (x1) positively affected endurance (x2).

Conclusion It suggests that higher levels of working heart rate are associated with higher BMI scores of overweight and obese Filipino preadolescents. They had a lower endurance level due to excess body weight.

HP-O-5

The effect of multi-joint exercise combined with self-efficacy theory intervention on self-efficacy in older adults with overweight or obesity

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Background Multiple-joint exercises are generally more effective at improving various health outcomes across different demographics. Additionally, self-efficacy theory has been shown to increase self-efficacy in older adults. However, the effectiveness of combining multiple-joint exercises with self-efficacy theory on self-efficacy in overweight or obese elderly individuals is not well understood. This study therefore aims to measure and compare changes in self-efficacy between multiple-joint exercise (MJ) and multiple-joint exercise combined with self-efficacy theory (MJS) in overweight/obese older adults.

Methods Forty-five overweight/obese older adults (MJS group, n = 22; MJ group, n = 18), aged 60–75 years, participated. The MJ program consisted of eight exercises, with two sets per exercise and a 1-minute rest between sets, totaling 60 minutes per session, performed 3 days per week for 6 weeks. The self-efficacy theory intervention incorporated four components: (a) Mastery experiences: providing knowledge about multi-joint exercises; (b) Modeling: a 30-minute conversation with a role model; (c) Verbal encouragement and compliments: offering support and praise; (d) Emotional arousal: awarding leaders. The MJ group participated only in the exercise program, while the MJS group received both the exercise program and the self-efficacy theory interventions. Self-efficacy was assessed using a questionnaire.

Results Both groups showed significant improvements in knowledge and self-efficacy. In the MJS group, knowledge increased from 5.86 ± 1.78 to 8.41 ± 1.26 and self-efficacy from 20.64 ± 3.19 to 29.18 ± 1.65. In the MJ group, knowledge increased from 6.50 ± 1.38 to 7.50 ± 1.89, and self-efficacy from 21.28 ± 2.11 to 26.89 ± 2.35. The MJS group also showed a greater increase in expectations (27.36 ± 3.39 to 29.73 ± 0.63, $p < 0.05$), while no significant changes were observed in the MJ group. The MJS group had higher levels of self-efficacy and expectations compared to the MJ group.

Conclusion Combining multiple-joint exercises with self-efficacy theory enhances self-confidence and exercise expectations in overweight/obese older adults, potentially improving exercise adherence. This approach should be recommended for this population.

HP-O-6

Physical activity and health issues in Bangladesh: a systematic review

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Background/Purpose The landscape of physical activity and health in Bangladesh is shaped by a complex interaction of socioeconomic factors, rapid urbanization, and an increasing burden of non-communicable diseases (NCDs). The purpose of this study was to examine the status of physical activity and its associated health challenges in Bangladesh.

Methods A literature review was conducted using keyword searches in peer-reviewed journals and databases such as ERIC, Google Scholar, Research Gate, and Academia.edu, focusing on publications from 2020 to 2024.

Results The findings and future directions are as follows. Low Levels of Physical Activity: Urbanization has spurred lifestyle changes in cities like Dhaka, where sedentary behaviors are now prevalent. Increased reliance on motorized transport, desk-bound occupations, and limited access to recreational spaces have led to a decline in physical activity. Health Challenges Linked to Physical Inactivity: The rise of NCDs such as heart disease, diabetes, hypertension, and obesity is partially attributable to physical inactivity and poor dietary habits. Additionally, urban stresses and physical inactivity are linked to a rise in mental health disorders, such as depression and anxiety. Government and Public Health Interventions: While government-led health campaigns and nongovernmental organizations (NGOs) have begun promoting physical activity and raising awareness of NCD risks, these efforts remain limited in scope. Cultural and Structural Barriers: Urban areas lack sufficient parks and recreational spaces, and rural areas prioritize manual labor over structured exercise. Initiatives and Future Directions: The government has developed a national NCD strategy, but more comprehensive policies integrating physical activity promotion are necessary.

Conclusion In conclusion, while Bangladesh faces significant challenges in promoting physical activity and addressing the rise of NCDs, there is potential for progress through strategic policy development and public health initiatives. Addressing urbanization and lifestyle changes will be key to improving the nation's health outcomes.



EXERCISE AND SPORTS BIOMECHANICS / HUMAN MOVEMENT / SPORTS MEDICINE

(BM)

BM-O-1

Do the penultimate foot contacts impulses differ between limb dominance during 180-degree change of direction in cricket?

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Background/Purpose In cricket, a 180-degree change of direction (CoD) while running between the wickets is an important skill for a batsman to master. Previous studies have reported that penultimate foot contact (PFC) is one of the important key steps since cricket players must decelerate their whole-body momentum and preparing to pivot to the opposite direction. PFC impulses are commonly examined for braking strategies. However, differences of PFC impulses during pivot turn between dominant limb (DL) and non-dominant limb (NDL) have not yet been explored particularly in female cricketers. Therefore, the purpose of this study was to compare PFC impulses (horizontal (hIMP), vertical (vIMP) and resultant (rIMP) impulses) between limb dominance during 180-degree pivot turns

Methods Nine Thai national female cricketers ran on force platforms at their maximum speed while holding a standard cricket bat and executed 180 degree-pivot turns. PFC impulse from three successful trials were averaged and analysed. A paired t-test revealed only significantly lower of hIMP on DL as compared to NDL ($p < .001$)

Results The result of this study shows that when cricketers execute with their dominant leg, they have a better preparation for the next foot contact by minimizing a breaking PFC impulse

Conclusion Understanding and optimizing PFC impulse can significantly enhance a cricketer's performance and reduce injury risk.

BM-O-2

Thigh muscle activation in competitive male distance runners wearing advanced footwear technology using T2-weighted MRI

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Background/Purpose Advanced footwear technology (AFT), such as the Nike Vaporfly shoes, which feature a highly-resilient midsole and a carbon-fiber plate, improves the metabolic cost of running. Given the strong correlation between the metabolic cost of running and muscle activation, AFT may reduce energy expenditure by influencing thigh muscle activation. Thus, this study aimed to clarify the effect of advanced footwear technology (AFT) on thigh muscle activation in distance runners following overground running, using T2-weighted magnetic resonance imaging (MRI).

Methods Twelve competitive male distance runners performed 10-min of overground running at a pace of 3'20"/km, using randomly assigned AFT or traditional footwear (TRAD) in two separate sessions with a 6-day interval. Before and immediately after running, T2-weighted magnetic resonance images of the right thigh were obtained. Transverse relaxation time (T2) of the rectus femoris (RF), vastus lateralis (VL), vastus medialis (VM), vastus intermedius (VI), sartorius (SA), adductors (AD), gracilis (GR), biceps femoris (BF), semitendinosus (ST), and semimembranosus (SM) were calculated from the images.

Results Two-way ANOVAs demonstrated no significant differences in T2 for the Time × Shoe interaction or between the shoe conditions across all examined muscles. A significant difference in T2 over time was observed in the BF ($p < 0.001$), ST ($p < 0.001$), SM ($p < 0.001$), and AD ($p < 0.001$) muscles in both AFT and TRAD conditions following overground running.

Conclusions This is the first study to clarify thigh muscle activation with AFT following overground running using T2-weighted MRI. The T2 showed a similar trend in both the AFT and TRAD conditions, with significant increase in the BF, ST, SM, and AD muscles after overground running. These findings suggest that AFT, with its highly-resilient midsole and a carbon plate, does not alter thigh muscle activation during overground running in competitive male distance runners.

Difference in ankle joint quasi-stiffness between the first and second stance phases in a sprint start

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Purpose This study aimed to clarify the difference in ankle joint quasi-stiffness between the first and second stance phases in a sprint start.

Methods A total of 15 sprinters (13 males and 2 females) performed a 10-m sprint starting from blocks on an indoor track. Ground reaction forces during the support phase of the first and second steps were measured by three force platforms embedded in the series. Ankle joint angle data were analyzed using a three-dimensional motion analysis system (VICON). The ankle joint moment was determined using inverse dynamics methods. Ankle joint quasi-stiffness was calculated based on a previous study.

Result The mean ankle joint quasi-stiffness was 18.72 ± 7.77 Nm/deg during the first step and 14.93 ± 4.73 Nm/deg during the second step. No significant difference was observed between the ankle joint quasi-stiffness of the first and second steps ($p = 0.06$). The mean contact time during the first step and second steps were 0.21 ± 0.03 s and 0.17 ± 0.02 s, respectively. A significant difference was observed between the contact times of first and second steps ($p < 0.05$). A previous study reported that ankle joint quasi-stiffness increases with the shortening of contact time during the maximum velocity phase. However, in the present study, ankle jointquasi-stiffness did not differ significantly between the first and second steps in a sprint start, while contact time was significantly shortened.

Conclusion This finding suggests that factors other than ankle joint quasi-stiffness may be responsible for the shortening of contact time in a sprint start.

Comparison of pronation in elite runners across Advanced Footwear Technology (AFT) shoes

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Background/Purpose In recent years, the superiority of Nike VaporFly (NVF) shoes has been extensively reported in biomechanics and exercise physiology, although AFT shoes have been developed by other shoe manufacturers. The characteristics of NVF are highly compliant, resilient and lightweight foams, the longitudinal stiffness of embedded rigid and curved carbon fibre plates. In addition, rocker bottomed and narrow construction can more easily to gain propulsive force during contact even if it is the unstable. This unstable construction may lead to undesirable motion associated with running-related injuries. Therefore, the aim of this study was to compare the pronation angle during foot contact when running with VF and other AFT shoes.

Methods Eleven male distance runners, who belong to a university athletics club participated in this study. They ran on an instrumented treadmill with a force plate with 2 types of AFT shoes, NVF and other (ASICS Meta Speed Sky; ASICS). They ran for 1 minute at a speed of 20 km/h. Ground reaction forces (GRF) were measured in three directions during running. Coronal plane motion was recorded from the posterior side at 240 fps and synchronized with the GRFs. The 1st and 2nd peak moments were determined. The Pronation angles at these moments were measured. A Three-way ANOVA of the moments, shoes, and laterality was examined.

Results Significant main effects of the moments and shoes were observed ($p = 0.016$), but no significant interaction was found.

Conclusion Significantly larger pronation angles were observed in NVF shoes compared to ASICS AFT shoes during running.

Validating golf biomechanical model using Kane's method

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Background/Purpose Determining the optimal technique for maximizing performance in sporting tasks is one of the greatest challenges in sports biomechanics. In golf swing analysis, 3D dynamic golfer model enables analysis and optimization of golf swing mechanics to improve performance. The study aims to develop a 3-D dynamic golf swing model with ten degrees of freedom using Kane's method and validate the model's accuracy in predicting joint torques.

Methods A four-segment golf swing model, comprising the left wrist, left elbow, left shoulder, and torso was developed. Forward dynamic approach is used to obtain the unknown torques generated by joint segments. The kinematic data from three right-handed professional golfers were collected using a 12-camera motion capture system, and their body segment parameters were estimated. This data was then used to drive the model computed in Matlab for each golfer individually. To validate the model, the calculated torque results were compared to the analysis performed by commercial software (Visual 3D, in conjunction with the Qualisys Motion Capture System) using Root Mean Square Error (RMSE) as a statistical measure to test the model's performance.

Results The results indicate that the torques calculated by the 3-D dynamic golf swing model closely match those observed during a golf swing, with an average RMSE of 0.1 Nm, demonstrating good performance.

Conclusion These results verify that the proposed Kane's model is suitable for use in further simulation analyses of various complex sporting motions. Its accuracy and effectiveness in modeling torques during the golf swing demonstrates its potential as a valuable tool for exploring and analyzing a wide range of dynamic movements in sports.

Comparison of ground reaction forces on the balance beam in artistic gymnastics

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Background/Purpose Due to its narrow dimensions (1.25 m in height, 0.1 m in width, and 5 m in length), the balance beam in gymnastics requires greater precision and balance than floor exercises. Biomechanical analysis is crucial for understanding the techniques, but there is limited data specific to balance beam routines. This study aimed to elucidate the characteristics of ground reaction forces (GRF) during balance beam routines.

Methods Ten female collegiate gymnasts (age: 19.1 years, height: 1.52 ± 0.4m, weight: 52.7 ± 3.48kg) participated. A 0.28 m high balance beam was placed on a force plate, and participants performed three successful trials of back handsprings, back somersaults, round-offs, and side somersaults. Peak vertical GRF and impulses during takeoff and landing were calculated.

Results The results showed that the peak vertical GRF during takeoff was 23.3 N/kg for the back handspring and 34.9 N/kg for the back somersault, with corresponding impulses of 5.0 Ns and 7.0 Ns, respectively. In addition, the duration of force application during takeoff was 0.01 seconds shorter for the somersault than for the handspring, indicating that greater force must be applied in a shorter time during the back somersault. The peak vertical GRF during landing was 46.2 N/kg for the back handspring and 193.1 N/kg for the back somersault, with corresponding impulses of 10.1 Ns and 38.3 Ns. The maximum lateral GRF during takeoff was 0.9 N for the back handspring and 1.1 N for the back somersault, while during landing, it was 5.0 N and 2.8 N, respectively. The duration of force application during landing was 0.017 seconds shorter for the somersault than for the handspring.

Conclusion Back somersaults on the balance beam generate greater peak vertical GRF and impulse at landing, suggesting higher impact forces, which may influence stability. The low lateral GRF indicates that balance control is well maintained.



SPORTS PERFORMANCE ENHANCEMENT / COACHING AND TRAINING (PE)

PE-O-1

Effects of Namman Mauy boxing oil on unexpected increases in knee flexor peak torque: insights from isokinetic biodex dynamometer analysis

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Background/Purpose This study investigates the unexpected effects of Namman Muay 'Boxing Oil-liniment' on knee flexor Peak Torque (PT) when applied to the quadriceps.

Methods Using the Isokinetic Biodex_Pro4 Dynamometer, we explored the liniment's broader implications beyond its intended muscle group. In this randomized controlled study, 24 male Muay Thai athletes were divided into experimental (5ml Namman Muay liniment) and control (5ml baby oil) groups, with applications on the dominant kicking leg's anterior thigh muscle. Isokinetic knee flexion tests at 60° and 180° per second measured PT in Newton meters (N.m).

Results showed significant strength enhancement in the Namman Muay group at both velocities ($p < 0.001$), while the control group showed limited improvement only at 60° per second ($p = 0.0042$). Analysis of knee flexion PT at 0.18ms revealed significant increases in the Namman Muay group at both velocities ($p < 0.001$), with no notable changes in the control group.

Conclusion These findings highlight the potential performance benefits of Namman Muay Boxing liniment on muscular strength, warranting further investigation in sports science research.

PE-O-2

Effect of plyometric jump training on the athletic performance of elementary school basketball players

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Background/Purpose The purpose of this study was to investigate the effects of plyometric jump training on the athletic performance of elementary school basketball players.

Methods The study involved 24 middle and high-grade basketball players from a primary school in Taichung City, Taiwan. Participants were divided into a Plyometric Training Group (PJT; n = 12, age = 10.8 ± 0.8) and a Sprint Group (SG; n = 12, age = 10.8 ± 0.8). Both groups underwent an equal amount of specialized basketball training during the experimental period. The PJT Group engaged in enhanced training using seven 50 cm jump boxes, while the SG group participated in routine sprint training. The training consisted of six cycles, with the first four weeks involving two cycles and subsequent four weeks adding one cycle every two weeks. Pre and post-training assessments included 5-meters and 20-meters sprint, Counter Movement Jump (CMJ), and Lane Agility Test.

Results The PJT group showed a significant increase in CMJ height ($p = .005$, ES = .309). In agility performance, the PJT group showed a significant improvement in test performance ($p = .027$, ES = .023); however, no significant differences were found between groups in the 20-meter dash.

Conclusion add 8 weeks plyometric training to regular basketball practice proved to be a feasible intervention to improve CMJ height and agility in elementary school basketball players.

PE-O-3

The influence of smartphone use during recovery on taekwondo-specific performance

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Background/Purpose This study aims to evaluate the effects of smartphone use during the recovery period after high-intensity Taekwondo exercise on athletes' Taekwondo-specific performance.

Methods Participants were screened using the Smartphone Addiction Scale-Short Version (SAS-SV) to identify individuals at high risk of smartphone addiction. During a 30- minute recovery period after high-intensity Taekwondo exercise, they were randomly assigned to one of two groups: smartphone use for social media browsing (SMA) group, which was instructed to browse any social media applications during the recovery period, or watching Taekwondo match videos (WMV) group. Subjective fatigue was evaluated using the Borg CR-10 scale for rating of perceived exertion (RPE), and taekwondo-specific performance was assessed using the Taekwondo-Specific Kick in Footwork Test (TSKFT).

Results There were no significant differences observed in taekwondo-specific kick frequency, valid kicks, or success rates for roundhouse and sidekicks between the SMA and WMV groups. However, the WMV group demonstrated significantly higher performance in free head kicks, with a higher kick frequency, valid kicks, and success rate compared to the SMA group ($p < 0.05$).

Conclusion Smartphone usage during recovery appears to have a varied impact on post-exercise performance. This finding offers insight into the different smartphone activities may impact performance, which providing athletes and coaches the strategies for optimizing competition preparation and recovery.

PE-O-4

Effects of plyometric training combined with blood flow restriction on muscle development and fencing-specific performance in amateur fencers

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Background/Purpose To excel in fencing, athletes must develop attributes like power, speed, endurance, agility, strength, coordination, and reaction time. Plyometric training enhances these components by utilizing the stretch-shortening cycle, improving explosive power and muscle efficiency. It also fosters neural adaptations that improve coordination, reaction times, and agility. Blood flow restriction (BFR) training supports performance by enhancing endurance and anaerobic capacity, allowing for sustained, repeated high-intensity efforts.

Methods This study examined the effects of plyometric training with BFR on physical and fencing-specific performance in amateur fencers. Forty-four fencers were randomly assigned to plyometric training with BFR (PLY-BFR; n = 16), plyometric training (PLY; n = 16), or controls (CON; n = 12). All groups participated in identical fencing training during the 8-week intervention. The PLY-BFR and PLY groups performed plyometric training twice weekly, consisting of four exercises resembling fencing movements, emphasizing horizontal motion. The BFR group wore a cuff set to 60% arterial occlusion pressure (AOP) during training. Athletes were assessed before and after the intervention for muscle strength, power, endurance, and fencing-specific performance.

Results Both the PLY-BFR and PLY groups showed significant improvements in fencing-specific performance, including the 10-meter steps, change of direction, repeated lunge ability, and lunge endurance. Enhancements in muscle structure, such as thigh and calf circumference, rectus femoris thickness, and cross-sectional area, were observed. Muscle function improvements included knee extension, flexion, horizontal countermovement jump, and reactive strength. The PLY-BFR group exhibited significantly greater gains in lunge endurance, rectus femoris thickness, and knee extension compared to the PLY group.

Conclusion These findings demonstrate that both plyometric training and plyometric training with BFR enhance muscle structure, function, and strength. Incorporating BFR further augments endurance, a key factor for sustained high-quality performance in fencing.

All locked up

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Background The pandemic has presented a necessary shift to online education or distance learning which is still new to most educators, especially in the Philippines. Moralista and Oducado (2020) mentioned, "uncertainty defines faculty perception toward online education during the pandemic outbreak as they are called to shift to a new normal or non-traditional mode of delivery of instruction."

Purpose Despite a myriad of barriers, educators continue to find ways to make learning more efficient and purposeful for students. Currently, the teaching of Streetdance, being part of the Physical Education (PE) program in several universities, also faces struggles to adjust to online education. The purpose of this study is to investigate two modes of feedback delivery (written and audio) on undergraduate students learning basic streetdance, particularly in Locking.

Methods Part of the methods that needed emphasis during this time was providing appropriate feedback for better dance learning. The study follows a quasi-experimental design wherein 40 participants were assigned to be part of either a Written Feedback Group (WFG) or an Audio Feedback Group (AFG). Pre-feedback and post-feedback evaluations were based on their execution of three Locking dance moves, namely, Scooby-Doo (SD), Scoobot (SB), and Stop N Go (SG). Evaluations were based on a rubric containing: (1) timing, (2) form, and (3) movement path.

Results Results show that for both groups, there was an overall improvement in the execution of SD, SB, and SG. However, while pre- vs post-feedback analysis showed significant improvements across all groups, the comparison between post-feedback WFG and AFG showed no significant difference.

Conclusion The results of the study show that the students' degree of improvement does not depend on the mode of feedback delivery. Both groups improved significantly, reinforcing the importance of teachers' feedback on learning dance in physical education, especially in an online set-up.

POSTER PRESENTATIONS



EXERCISE PHYSIOLOGY

(EP)



EP-P-1

Does greater isometric muscular strength indicate higher maximum aerobic power ?

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Purpose Maximum oxygen uptake (VO_{2max}) is influenced by the amount of muscle group involved and the progression of fatigue during exercise. Previous studies suggested that greater muscular strength may enhance fatigue resistance, which could imply a potential influence on VO_{2max}. However, the relationship between muscular strength and VO_{2max} remains unclear, especially when similar muscles are involved. This study aimed to explore the correlation between muscular strength and VO_{2max} when similar muscle groups are engaged during testing.

Methods Forty active male college students completed isometric mid-thigh pull (IMTP) and cycling graded exercise test (GXT) on different day. The peak force (PF), 5-second mean force (MF), maximum RFD, and RFD within 0–30, 0–90, 0–150, 0–200, and 0–250 milliseconds during IMTP were measured, along with VO_{2max}, maximum heart rate, and peak power output during GXT. Participants were categorized into high (GHS_{PF} and GHS_{MF}) and low (GLS_{PF} and GLS_{MF}) muscular strength groups based on the median PF (1940 N) and MF (1938 N).

Results Significant relationships were found between PF and VO_{2max} ($r = 0.324$, $r^2 = 0.10$, $p < .05$), and between MF and VO_{2max} ($r = 0.321$, $r^2 = 0.10$, $p < .05$) in the pooled data. VO2max were significantly higher in GHSPF ($t = 2.435$, $p < .05$) and GHSMF ($t = 2.742$, $p < .05$) than those in GLS_{PF} and GLS_{MF}. However, a large variation in VO_{2max} (up to 76%) was observed among participants with similar PF/MF in the relationship plot.

Conclusion Although there is a correlation between muscular strength and VO_{2max}, muscular strength explains only 10% of the variance in VO_{2max}. This suggests that muscular strength may not be a key factor in determining VO_{2max} when the involved muscles are similar.

EP-P-2

A comparison of testosterone therapy on macro- and micro-vascular function in transgender men

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Purpose To determine the differences in health-related physical fitness and macro- and micro- vascular function between cisgender women, cisgender men and transgender men.

Methods A cross-sectional study was conducted with cisgender women (CW; n = 15), cisgender men (CM; n = 15) and transgender men (TM; n = 15), matched for age and physical activity level. The TM group had received hormone therapy for a mean of 3.9 ± 2.6 years. Health-related physical fitness variables were assessed in all participants. Measures of macrovascular function such as carotid intima-media thickness (cIMT), flow-mediated dilatation (FMD) and arterial stiffness assessed by brachial-ankle pulse wave velocity (baPWV) were obtained. Post-occlusive reactive hyperemia (PORH), assessed by laser Doppler flowmetry, represented microvascular function.

Results CM and TM had higher testosterone and lower estradiol than CW (all $p < 0.05$). CM and TM had lower body fat and higher muscle strength, muscle endurance and maximal oxygen consumption than CW (all $p < 0.05$). There were no significant differences in cIMT between CW, CM and TM. TM had lower FMD and baPWV than CW and CM (all $p < 0.05$). PORH was lower in CM and TM than in CW (all $p < 0.05$).

Conclusion A prolonged course of testosterone therapy has been demonstrated to enhance physical fitness advantages in transgender men. However, testosterone therapy has also been associated with impaired macro- and microvascular function in this population.

EP-P-3

Mat Pilates training on blood pressure, inflammatory, and oxidative profiles in hypertensive elderly

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Background/Purpose To determine the effects of mat Pilates training on blood pressure, inflammatory, and antioxidative markers in hypertensive elderly people.

Methods Thirty-four hypertensive subjects aged 60-75 years were randomly divided into a control group (CON; n = 17) and a mat Pilates training group (MP; n = 17). The CON participants conducted normal daily activities and participated in neither organized exercises nor sports training, while those in the MP group received mat Pilates training for 60 min three times/week for 12 weeks. Parameters including blood pressure, cardiovascular function, nitric oxide (NO), tumor necrotic factor-alpha (TNF-α), superoxide dismutase (SOD), and malonaldehyde (MDA) were collected at baseline and the end of 12 weeks.

Results The MP group had significantly decreased blood pressure, improved cardiovascular variables, decreased MDA and TNF-α, and increased NO and SOD compared with the CON group and the pre-training period ($p < 0.05$).

Conclusion In conclusion, these findings demonstrate the positive effects of 12 weeks of mat Pilates training in terms of reducing blood pressure and increasing blood flow related to improvements in anti-inflammatory and antioxidative markers in hypertensive elderly people. Mat Pilates training might be integrated as an alternative therapeutic exercise modality in clinical practice for hyper-tensive elderly individuals.

EP-P-4

Effects of Swedish massage prior to circuit breathing exercises on asthma control and respiratory muscles strength in patient with asthma

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Background Asthma is a common, chronic condition that causes symptoms such as shortness of breath, wheezing, chest tightness, and coughing due to reversible airway obstruction and inflammation. Breathing exercises are widely used globally as a non-drug therapy for asthma. Swedish massage, known for improving circulation, relaxing muscles, and reducing stress, may also help manage asthma. Circuit breathing is recognized for improving respiratory muscle strength. However, no studies have yet combined breathing exercises with Swedish massage for asthmatic patients. Therefore, the purpose of this study was to determine the effects of Swedish massage followed by circuit breathing exercises on asthma control and respiratory muscle strength in patients with asthma.

Methods Thirty asthma patients aged 18 to 65 with mild to moderate severity were randomly divided into three groups. The first group (SCB; n = 10) received 20-minute sessions combining Swedish massage and Circuit Breathing Training for twelve weeks. Each session included a 20-minute Swedish massage followed by four breathing exercises. The second group (CBT; n = 10) performed only the four breathing exercises. The third group (CON; n = 10) received no intervention. Respiratory muscle strength variables, such as Maximal Inspiratory Pressure (MIP) and Maximal Expiratory Pressure (MEP), and asthma control outcomes, including the Asthma Control Test (ACT) and the Mini Asthma Quality of Life Questionnaire (Mini AQLQ), were analyzed at Pre-test, Mid-test, and Post-test intervals between groups. Data analysis was conducted using two-way repeated measures ANOVA, with significance set at $p < 0.05$, and the LSD method was used to test for differences between groups.

Results After twelve weeks, both the SCB and CBT groups showed a significant increase in MIP, MEP, ACT, and Mini AQLQ scores compared to the CON group ($p < 0.05$). However, no significant differences were observed between the SCB and CBT groups.

Conclusion These findings indicate that twelve weeks of Swedish massage followed by circuit breathing exercises can effectively improve respiratory muscle strength and asthma control in patients with asthma.

EP-P-5

A comparison of pain perception, tissue morphology, and muscle peak torque between legs in female Iliotibial band syndrome runners

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Background/Purpose Iliotibial band syndrome (ITBS) is an overuse injury causing chronic inflammation. The most common symptom includes pain and occasionally swelling at the lateral aspect of the knee. Furthermore, a decreased strength of the hip abductor muscle, especially the Gluteus medius (GMed) contributes to the risk of ITBS injury. Therefore, this study aims to evaluate the side differences in pain, morphology, and muscle strength in female ITBS runners.

Methods Twenty-one female ITBS runners (36.52 ± 6.43 years) volunteered for this study. All participants reported single-side ITB pain, in which the other side acts as a control. Interested variables include the pain Numeric Rating Scale (NRS) and the pressure pain threshold (PPT) were collected. ITB and GMed muscle thickness were evaluated using ultrasonography. The hip and knee muscle strength were tested between the legs.

Results The mean NRS in female ITBS runners was 4.33 ± 1.15 (score range 3-6). There was no significant difference in PPT between the ITBS and the control legs. However, the ITBS leg showed a significant difference in ITB thickness ($p < 0.01$) and GMed muscle thickness ($p < 0.05$) compared to the control. Only a significant difference in peak torque hip flexion ($p < 0.05$) was observed between legs.

Conclusion Female runners with ITBS were likely to have asymmetrical tissue morphology and muscle strength. Injury on one leg would affect the change of the other since running is a bilateral cyclic motion.

EP-P-6

Effects of Thai dance on physiological factor and flexibility in older adult with mild cognitive impairment

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Background/Purpose Dancing has been proposed as a beneficial type of physical exercise, including cardiorespiratory endurance, strength/endurance, body agility, balance, body fat, and flexibility. Thai dance can be incorporated into the community's cultural context and daily life of older adult, which can result in sustained physical capability of the elderly. Therefore, the aim of this investigation was to determine Thai dance on physiological and flexibility in older adult with mild cognitive impairment.

Methods This study included 38 individuals diagnosed with MCI, aged between 64 and 77 years, were recruited and randomly assigned into two groups: a Thai dance group (TDG) (n = 19) and a control group (CG) (n = 19). The TDG exercised for 60 minutes three times a week for 12 weeks. while the CG kept their normal daily activities. Flexibility variables was assessed using senior fitness test including chair sit and reach test is measured in distance and reflects lower body flexibility, and the back scratch test is measured in distance and reflects upper body flexibility. The physiological data and flexibility variables were analyzed during the pre- and post-tests. The dependent variables between pre-test and post-tests were analyzed using paired t-test. An independent t-test was used to compare the variables between groups. Differences were considered to be significant at $p < .05$.

Results The results indicated that after twelve weeks, the TD group decreased body weight, body mass index, and resting heart rate compared to pre-test ($p < .05$). Moreover, the TD group had significantly higher flexibility variables including chair sit and reach test and the back scratch test than pre-test ($p < .05$).

Conclusion In conclusion, the present finding demonstrated that Thai dance can improved physiological and flexibility among older adults with MCI.

EP-P-7

Association between cognitive function and physical fitness in older adults with type 2 diabetes mellitus and mild cognitive impairment

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Background/Purpose Nordic Walking in Water (NWW) is an innovative exercise that is safe and effective for whole-body therapy, suitable for everyone. NWW has been proven to improve physical fitness, vascular and cerebrovascular function, glycemic control, and cognitive function in older adults with type 2 diabetes mellitus (T2DM). This is because NWW involves using both arms and legs to move through water resistance. However, the relationship between changes in cognitive function and physical fitness has not been investigated. This study aimed to investigate the relationship between cognitive function tests and physical fitness batteries in older adults with T2DM and mild cognitive impairment (MCI).

Methods Thirty-three older adults (60–74 years old) with T2DM and MCI were randomly divided into a control group (17 participants) and an NWW group (16 participants). The NWW group performed exercises in water at 34 to 36°C, 3 sessions per week, 40 minutes per session, at 40–50% of heart rate reserve (HRR) for the first 6 weeks and 50–60% HRR for the later 6 weeks. Before and after the 12-week intervention, both groups were tested for physical performance, including sit and reach, arm curl, chair stand, time up and go, and the 6-minute walk test (6MWT), as well as cognitive function using the Montreal Cognitive Assessment (MoCA).

Results The study showed associations between changes in cognitive function and physical performance measures. Changes in MoCA scores were related to changes in sit and reach ($r = 0.464$), arm curl ($r = 0.508$), chair stand ($r = 0.472$), time up and go ($r = -0.446$), and 6MWT ($r = 0.476$), all with p-values < 0.05.

Conclusion We concluded that improvements in cognitive function (MoCA) in older adults are related to physical fitness, including lower limb flexibility, muscle strength, agility and balance (time up and go), and cardiorespiratory endurance (6MWT).

EP-P-8

Effects of Pilates training on respiratory muscle strength and peak nasal inspiratory flow in patients with allergic rhinitis

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Background/Purpose This study aimed to investigate the effects of Pilates training on respiratory muscle strength and Peak Nasal Inspiratory Flow (PNIF) in patients with allergic rhinitis.

Methods Twenty patients with allergic rhinitis, aged 18–35, were randomly assigned to either a control group (CON; n = 9) or a Pilates training group (PT; n = 11). The CON group continued their usual daily routine without any intervention, while the PT group underwent a Pilates program three times a week for ten weeks (60 minutes/time). Physiological data, respiratory muscle strength, and PNIF were assessed before and after intervention. A paired t-test was used to analyze changes within each group, and an independent t-test was applied to compare variables between groups.

Results After ten weeks, the PT group showed significant improvements in respiratory muscle strength variables such as maximum inspiratory pressure MIP) ($p < .05$) and maximum expiratory pressure (MEP) ($p < .05$). Additionally, PNIF significantly increased in the PT group, both compared to pre-test and the CON group ($p < .05$).

Conclusion The finding suggests that 10 weeks of Pilates training significantly enhances respiratory muscle strength through controlled Pilates breathing. This training also improves nasal inspiratory flow, helping to clear the nostrils and refresh airflow in patients with allergic rhinitis. Therefore, Pilates training may serve as a beneficial exercise intervention for individuals with allergic rhinitis.

EP-P-9

A comparison of speed and agility performance in Thai wheelchair basketball athletes with different functional categories

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Background Wheelchair basketball (WB) has identified speed and agility performance as sports-specific skills in manual wheeling control movements, making these abilities essential in the evaluation for wheelchair athletes. This study aimed to compare the speed and agility performance of Thai WB athletes with different functional classification scores.

Methods Twenty-nine (16 male and 13 female) Thai WB athletes (Mage = 28 ± 8 years) were enrolled in this study. The Internation Wheelchair Basketball Federation (IWBF) classification scores divided the athletes into two functional categories (Category A (n = 13): 1.0–2.5 points, and Category B (n = 16): 3.0–4.5 points). The speed performance was measured by the 10 m and 20 m sprint tests, while the agility performance was measured by the agility t-test and the Illinois agility test. The independent sample t-test was used to compare the two groups. Statistical significance was set at $p \leq .05$.

Results The results indicated that there were no significant differences for the 10 m sprint test, $t(25.997) = -.247$, $p = .806$, despite category A ($M = 3.03$, $SD = .29$) using shorter durations than category B ($M = 3.05$, $SD = .29$). Similar performance was also detected in the 20 m sprint test, $t(27) = .004$, $p = .997$, category A ($M = 5.32$, $SD = .56$) and category B ($M = 5.32$, $SD = .58$). There was also no significant difference for the agility t-test, $t(27) = -1.163$, $p = .255$, despite category A ($M = 13.54$, $SD = 1.58$) using shorter durations than category B ($M=14.29$, $SD = 1.80$). For the Illinois agility test, $t(27) = -.440$, $p = .664$, category A ($M = 25.80$, $SD = 1.90$) also using shorter durations than category B ($M = 26.19$, $SD = 2.69$)

Conclusion Thai WB athletes showed no difference in speed and agility performance between the lower- and the higher-functional categories.

EP-P-10

Peripheral, cutaneous, and renal vascular function in elderly diabetic patients with and without diabetic kidney disease

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Purpose To evaluate skin and renal microvascular function in elderly diabetic patients with and without diabetic kidney disease.

Methods Two groups of older adults with type 2 diabetes were studied: one group with normal kidney function (DM, n = 16) and another diabetic kidney disease (DKD, n = 20). Skin microvascular function was assessed by cutaneous blood flow (CBF) and post-occlusive reactive hyperemia (PORH) was measured using laser Doppler flowmetry. Renal microvascular function as represented by renal resistance index (RI) was assessed using Doppler ultrasound.

Results Two groups were matched for age (68 ± 4 and 69 ± 4 years), physical characteristics (BMI and body fatness), blood glucose and HbA1C concentrations. The measures of renal function, including blood urea nitrogen, creatinine, estimated glomerular filtration rate (62 ± 11 vs. 92 ± 5 ml/min/1.73m2), and cystatin C were worse in DKD than in DM (allp < 0.05). Brachial artery flow-mediated dilation, maximum CBF, and PORH (116 ± 23 vs. 60 ± 17%) were lower and RI were greater in DKD than in DM (all p < 0.05). Arterial stiffness as assessed by brachial-ankle pulse wave velocity and carotid artery compliance was not different between the two groups. Significant associations were observed between eGFR and PORH (r = 0.66, p < 0.001), and between RI and PORH (r = -0.61, p < 0.001).

Conclusion Among elderly patients with diabetes, the presence of kidney disease is associated with cutaneous and renal microvascular dysfunction. These microvascular dysfunctions appear to be systemic in nature considering a number of significant associations between different tissues.

EP-P-11

Effects of walking exercise on different surfaces in elderly people

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Purpose To measure and compare effects of walking exercise on artificial grass surfaces (AGS) vs. different surfaces (DS) on balance ability in the elderly.

Methods Thirty elderly (11 males, 19 females) from Mae Mok Village, Lampang Province were recruited and randomly divided into two groups: walking exercise on artificial grass surfaces (AGS) (5 males, 10 females) and walking on different surfaces (DS) (6 males, 9 females). Both groups would be walking exercise 30 minutes/day, 5 days/week, for 8 weeks, at a moderate intensity of 50-60% of HRR. Before and after the exercise program, pressure in the soles of the feet assessed by the foot scan system (Matscan), strength of leg muscles by a hand-held dynamometer on the quadriceps and gastrocnemius, and time up and go (TUG) assessed for measuring ability to balance were measured.

Results After 8 weeks, the AGS and DS groups had significantly greater increases in muscle strength and balance ability than before the program (all $p < 0.05$), but there were no statistical differences between the AGS and DS groups. However, the trend of change in the DS group was better than the AGS group.

Conclusion Walking exercise on different surfaces improved vastus medialis and medial gastrocnemius strength and improved stability performance in elderly people after 8 weeks. The elderly should choose to walk exercise on different surfaces, which will help to reduce the risk of falls in the elderly.

EP-P-12

Health-related physical fitness and arterial vascular function of aged match inactive workers vs. amateur trail runners

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Purpose The aim of the present study is to compare the health-related physical fitness and arterial vascular function of aged match inactive workers with those of amateur trail runners.

Methods A cross-sectional study was conducted on two groups of office workers: those who were inactive (INA, 40.5 ± 3.8 years, n = 16) and amateur trail runners (ATR, 40.7 ± 3.3 years, n=20). The average duration of participation in level and trail running for the ATR group was 379.5 ± 61.3 minutes per week. A series of health-related physical fitness tests were conducted in order to determine the following variables: body fat percentage, fat mass, lean mass, maximal oxygen consumption (VO_{2max}), flexibility, muscle strength and endurance. Assessments of arterial vascular function were determined, including measurement of carotid intima-media thickness (cIMT), flow-mediated dilatation (FMD), and arterial stiffness, evaluated with brachial-ankle pulse wave velocity (baPWV).

Results The ATR group exhibited significantly lower body weight, body fat, and fat mass, heart rate at rest and systolic blood pressure, as well as higher VO_{2max} and chair-stand performance (all $p < 0.05$). No significant differences were observed between the two groups in muscle strength and flexibility. Compared to INA, ATR exhibited lower cIMT and baPWV, and higher FMD (all $p < 0.05$).

Conclusion The trail runners demonstrated superior health-related physical fitness and vascular function, comparable to those of inactive workers of a similar age.

EP-P-13

Ratings of perceived exertion validity in young children using omni pictorial scale

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Purpose The purpose of the study was to evaluate the capacity of young children to understand perceived exertion scales and to determine various levels of aerobic exercise intensities in production and estimation modes.

Methods Fifty-eight children (29 boys and 29 girls, 5-7 years old) participated in the study. All children underwent similar trials: The first was to evaluate the child's maximal aerobic exercise intensities on a treadmill and to introduce the Ratings of Perceived Exertion (RPE) concept through OMNI/RPE Scale. The second was the treadmill speed estimation trial at three different running (exercise) intensities (low at 20% maximal speed (MS), moderate 60% (MS), and high 100% (MS); the duration of each stage was two minutes. In the last trial (production), the child was asked to run randomly (produce) at three different intensities (speeds) on a track based on their understanding of the OMNI scale levels (2, 6, and 10). During all trials, the child's heart rate (HR) and speed were recorded as physiological and performance indicators of exercise intensity.

Results A One-way repeated measure (ANOVA) indicated significant statistical variations at ($p \leq 0.05$) among the mean values in all the estimation trials (low 20%, moderate 60%, high 100%) of the OMNI/RPE (2.83 ± 1.6, 6.76±1.9, 9.93 ± .5 respectively) and the heart rate (113.5 ± 13.1, 148.41 ± 9.6, 192.66 ± 8.4 (beat per minute: BPM) respectively). Similar results were found in production trials at 2, 6, 10 of OMNI scale RPE among the mean values of produced speed (7.5 ± 1.7, 8.63 ± 1.3, 10.43 ± 1.33 (Kilo Meter Per hour: KMPH) respectively) and heart rate (138.7 ± 17.2, 162.3 ± 13,189.1 ± 6 BPM). A simple linear regression analysis showed a positive relationship between perceived exertion and speed and heart rate variables ($p \leq 0.05$).

Conclusion It is concluded that children between (5-7) years old can recognize their RPE in three levels of exercise intensities (low, moderate, and high) in both estimation and production (speed) trials.

SPORTS AND HEALTH POLICY, MANAGEMENTS & TOURISM

(SM)



SM-P-1

Guidelines for developing competitive management strategies of the flying disc association of Thailand

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Purpose This research studies the systems, processes, and opinions regarding the organization of Ultimate Frisbee team competitions to analyze the problems arising from the competitions and to develop strategic management guidelines for the Thailand Flying Disc Association.

Methods Data collection was conducted using a total of 222 questionnaires from sports management experts, stakeholders, athletes, spectators, and supporters. The five sets of questionnaires, each with content validity (IOC) ranging from 0.80 to 1.00 and reliability 0.95, SWOT Analysis and PEST Analysis were used to evaluate four dimensions: competition organization system, competition process, opinions on competition organization, and training.

Results The research findings revealed that sports management experts of the Flying Disc Association had an average opinion score of 3.73 with an S.D. of 0.45 regarding the competition system. The sub-committee for competition organization, the association's executive committee, referees, coaches, athletes, spectators, and supporters had an average opinion score of 4.06 with an S.D. of 0.47 regarding the competition process. They had an average opinion score of 3.31 with an S.D. of 0.58 regarding athlete training. The researcher then analyzed the data using SWOT Analysis and PEST Analysis.

Conclusion Based on the results from the questionnaires and analysis, the strategic guidelines for improving competition organization are as follows: Organizational Level Strategy: Define vision, mission, and objectives using growth strategies to enhance the development of the Flying Disc Association, focusing on operational expertise to achieve efficiency. Business Level Strategy: Improve sports competition by using differentiation strategies to add value, enhance capabilities and knowledge, needs of stakeholders involved in the association and competitions. Functional Level Strategy: Define marketing, financial, production, technology, and human resource management functions. The functional level strategy is crucial for achieving goals and includes recommendations and controls to ensure quality and efficiency in operations according to the plan.

EXERCISE AND SPORTS PSYCHOLOGY / NEURO-MOTOR LEARNING (PN)



PN-P-1

A comparative study of anxiety and self-confidence between male and female taekwondo athletes

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Background/Purpose This study aimed to compare competition-related anxiety and self-confidence between male and female Taekwondo athletes. Understanding these psychological factors is crucial for enhancing athlete performance and mental well-being.

Methods The sample consisted of 168 Taekwondo athletes (84 male and 84 female). The Revised Competitive State Anxiety Inventory (CSAI-2R) was used to measure somatic anxiety, cognitive anxiety, and self-confidence. Descriptive statistics and t-tests were used to analyze differences between the two groups.

Results Male athletes demonstrated low levels of somatic anxiety ($M = 13.01$, $SD = 3.309$) and cognitive anxiety ($M = 10.15$, $SD = 2.691$), comparable to female athletes (somatic anxiety: $M = 12.96$, $SD = 4.016$; cognitive anxiety: $M = 10.98$, $SD = 3.282$). There was no significant difference in anxiety levels between male and female athletes ($p > .05$). However, male athletes exhibited significantly higher self-confidence ($M = 15.85$, $SD = 2.796$) than female athletes ($M = 14.69$, $SD = 2.978$), with a statistically significant difference ($p < .05$).

Conclusion The study found that while both male and female athletes exhibited low and similar levels of anxiety, male athletes displayed significantly higher self-confidence. These findings highlight the importance of potentially focusing on strategies to improve self-confidence in female athletes during competition.

PN-P-2

Association between coach-athlete relationship, psychological safety and performance in Thailand

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Background This study investigated the role of coach-athlete relationship maintenance strategies usage on psychological safety, and performance outcomes of athletes in Thailand. As the literature on coach-athlete relationship provided evidence that coach's behaviour can have a significant effect on the relationship with athlete and their psychological safety and performance satisfaction. The COMPASS model provided framework of coach-athlete relationship maintenance behaviour that has shown to predict psychological safety in athletes. However, there has been little to no number of studies being done within the field of sports on the topic of psychological safety in Thailand.

Purpose To bridge the gap whether the framework of the COMPASS model and psychological safety could be applicable to the context of athletes in Thailand. As well as highlighting the importance of coach's behaviour and coach-athlete relationship with their athletes in creating a safe sporting environment.

Methods 34 participants in Thailand, over 18 years of age, who are, or have been involved in organised competitive sports as a player, were recruited and asked to complete a set of questionnaires assessing coach-athlete relationship maintenance strategies usage (CARM-Q), psychological safety (SPSI), as well as their performance satisfaction (ASQ).

Results Multiple linear regression revealed a significantly strong predictive value of usage of the COMPASS model's relationship maintenance strategies on psychological safety, but a non-significant moderate predictive value on performance satisfaction. In contrast, a bivariate linear regression suggested the predictive value of psychological safety on performance satisfaction to be insignificant.

Conclusion These findings highlighted the impact of coach's behaviour in maintaining coach-athlete relationship on the athletes' psychological safety, whereby strategies based on the COMPASS model could be applicable to the context of Thai athletes. This also highlighted potential for future research on providing a psychologically safe environment for athletes in Thailand.

PN-P-3

Processing Paris: evaluating the efficacy of a post-Olympic game psychological decompression intervention for elite performers

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Background/Purpose The "Post-Olympic Blues" refers to the phenomenon where elite athletes may experience maladaptive psychological responses after participating in the Olympic Games. While this has been studied in athletes, limited research has examined its effects on coaches, who—despite being elite performers themselves—may encounter similar psychological challenges. The aim of this study was to evaluate the effectiveness of a psychological decompression intervention designed to help both athletes and coaches process the emotion surrounding their Olympic experience, decompress from any potential maladaptive psychological responses, and promote their psychological readiness for future competition.

Methods The intervention was theoretically underpinned by a strengths-based approach from positive psychology and involved both athletes and coaches who participated in the Paris 2024 Olympic or Paralympic Games. A trained sport psychologist delivered the intervention as a brief, one-on-one session lasting approximately one hour. To evaluate its efficacy, a follow-up qualitative survey was administered to assess participants' perceptions of the session. Using the Kirkpatrick model as a framework, the survey evaluated the intervention's impact across four levels: Reaction, Learning, Behavior, and Results.

Results Preliminary results indicate that participants perceived the intervention positively, highlighting its effectiveness in helping them process both the positive and negative emotions associated with their Olympic experience. Reported benefits included increased self-awareness, greater psychological flexibility, and enhanced psychological recovery. Additionally, participants expressed a more positive outlook and an improved sense of psychological readiness for future goals and challenges.

Conclusion This study underscores the importance of providing holistic psychological support for both athletes and coaches following major sporting competition. The positive feedback from these elite performers suggests that strengths-based psychological decompression interventions can be an effective tool for promoting psychological recovery, sustaining long-term performance, and enhancing psychological readiness for future competition.

PN-P-4

Athlete motivation and mental toughness among student- athletes

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Background/Purpose There exists a stigma surrounding mental toughness (MT), particularly in the context of sports, where it is often considered an indicator of athletes' psychological well-being (Bird et al., 2021). When athletes fall short in performance, they are frequently labeled as lacking mental toughness, and in more severe cases, they may be branded as mentally weak or soft. This labeling can have detrimental effects on the athletes' motivation, confidence and well-being. This study investigated the relationship between athlete motivation and mental toughness and exploring how these factors interplay and influence athletic performance and well-being. This research aimed to understand how motivation impacts mental toughness levels among student-athletes of the University of Mindanao.

Methods The study employed a quantitative research method, using a descriptive correlational design with data gathered from 150 student-athletes. A modified survey questionnaire was utilized for both dependent and independent variables, with respondents selected through stratified random sampling.

Results The result of the study revealed that the three indicators of athlete motivation depict a very high and high level of motivation respectively. Moreover, athlete motivation and mental toughness of student-athletes displayed a significant positive correlation. This suggests that having strong positive attitudes towards motivation helps students to keep going and achieve success. Motivation related to being a student-athlete and pursuing a sports career also shows positive correlations with confidence, linking academic and athletic aspirations with confidence and motivation levels. Additionally, factors like control and constancy influence overall motivation alongside domain-specific motivational factors.

Conclusion The findings revealed that the overall level of athlete motivation was very high. As to the mental toughness the result revealed as high. The analysis revealed a positive correlation between the two variables. This positive relationship indicates that as athlete motivation increases, mental toughness also tends to increase, and vice versa.



HEALTH PROMOTION / PHYSICAL ACTIVITY AND WELLNESS

(HP)

HP-P-2

A study of recreational activity patterns on cognitive abilities of elderly

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Background/Purpose The purpose of this study investigates the effects of 8 weeks recreational activity interventions on cognitive function in Thai elderly.

Methods Fifty-four healthy elderly (aged 60-80) were enrolled and equally assigned to 2 groups of recreational activity interventions (sports, games, arts and crafts-related recreations group, SAC; and group 2, recreational dancing group, RD), and a control group (CG). The recreational activity programs of each experimental group were applied for 8 weeks, 3 days per week, 60 minutes per day. The baseline, mid-test at week 4, and post-test after week 8, assessments comprised Simple Reaction Time Test (SRT), Choice Reaction Time Test (CRT), Trail Making Test (TMT) and Flanker Test (FKT). The two-way ANONA with repeated measure and Bonferroni post-hoc test were run on each of the dependent variables.

Results The changes in cognitive function of elderly were found, 1) the SAC group performed significantly superior at post intervention on accuracy rate of CRT, Completion time of TMT B, and response accuracy of both congruent and incongruent FKT, as compared to base line performances, 2) the RD group were reported that intervention enhanced the cognitive abilities of accuracy rate of SRT, less errors for TMT B, response accuracy of incongruent of FKT, 3) the control group better cognitive skills at post-test were observed on response time of CRT, response time and accuracy rate of incongruent FKT.

Conclusion Both recreational activities appear to facilitate the elderly's cognitive functioning including speed of information processing and executive functions.

HP-P-3

Early physical activities protocols with multidisciplinary approach in critically ill patients

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Background Immobilization are commonly administered in critically ill patients which induce ICU-acquired weakness impacted on patients physical deconditioning. Early physical activity in critically ill patients is a profound role to help prevent and to reduce invasive mechanical ventilation duration, day in bed, intensive care unit (ICU) and hospital length of stay.

Purpose To determine the early physical activity protocols with multidisciplinary approach on critically ill patients.

Methods Twenty-eight ICU patients undergoing mechanical ventilations for 5 days were randomized into usual-care group (n = 14, 68.71 ± 16.51years) and multidisciplinary group (n = 14, 63.86 ± 15.02 years). Usual-care group provided a physical therapy session and multidisciplinary team followed protocols twice a day (physical therapy and ICU nurse sessions), which goals were daily assessed and set by physical therapist. The protocols started with passive physical activity and increased level to active and out of bed activity. All interventions terminated when a patient extubated and discharged from ICU.

Results Baseline levels of ages, SOFA scores and APACHE II scores were similar between the groups. Multidisciplinary group obtained lower treatment duration (4.6 vs. 6.9 days, $p = 0.037$) with more frequency (6.6 vs. 4.2 times, $p = 0.026$). No significant differences were observed for ventilator days (7.4 vs. 7.9 days, $p = 0.711$), length of stay in ICU (9.6 vs. 9.7 days, $p = 0.962$), and hospital (14.6 vs. 18.0 days, $p = 0.144$). Mobility scale was significantly increased in both groups ($p \leq 0.05$). There were no adverse events in both groups. Twelve patients able to go out of bed in 4.5 and 9 days in multidisciplinary and usual-care group respectively.

Conclusion The early physical activity protocols with multidisciplinary approach did not significantly greater number of ventilator days, length of stay in ICU and hospital than usual physical therapy care. However, the protocols are safe and time-efficient enhancing physical activity in critically ill and ventilated patients.

HP-P-4

Relationships between waist circumferences measured at different anatomical sites with metabolic syndrome risk in Chinese adults

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Background/Purpose This study aimed to evaluate differences among Waist Circumferences (WC) at different anatomical sites and determine relationships between WC with Metabolic Syndrome (MetS) risk factors in Chinese adults.

Methods 213 participants aged 18–35 years old were recruited. WC was measured at: immediately above the iliac crest (WCiliac), immediately below the lowest rib (WCrib), midpoint between the lowest rib and the iliac crest (WCmid), 1 cm above the umbilicus (WCumb), and at the minimal waist (WCmin). Body fat mass (FM), body fat percentage (%BF), abdominal FM and abdomen %BF were determined. MetS risk factors including systolic blood pressure (SBP), diastolic blood pressure (DBP), fasting plasma glucose (FPG), triglyceride (TG), and high-density lipoprotein cholesterol (HDL-C) were measured.

Results The WC measurements at different sites among Chinese adults varied from one another. WCs exhibited the following pattern: WCmin < WCrib < WCmid < WCumb < WCiliac in females and WCmin, WCrib < WCumb < WCmid < WCiliac in males. All WCs were significantly correlated with FM, abdomen FM, %BF, abdomen %BF, SBP (in males), DBP (in males), TG and HDL-C during both genders. After being adjusted by age, height, weight, and BMI, significant influences were found on WCrib and WCmin to predict MetS risks in males, all WCs predicted MetS risks in females. Moreover, WCs significantly influenced overfat for both males and females, except for WCmin in males.

Conclusion WCs at five different sites among Chinese adults had very good reliabilities and varied from one another, they were not interchangeable. WCs correlated with blood pressure in males, as well as body fat variables and blood fat variables during both genders. WC was a potential independent risk factor and could provide references to predict overfat and risks of metabolic syndrome in Chinese adults.

Effect of guava leaf extract body cleansing spray on the reduction in microorganism viability and anti-perspiration in young adults

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Background/Purpose Numerous studies have demonstrated that guava leaves (Psidium guajava Linn.) can decrease sweat secretion. Additionally, polyphenols (such as tannins and flavonoids) may possess astringent and antimicrobial properties. There is currently limited information available on healthcare products that aid in prompt sweat stain removal and decrease microorganism viability post-exercise and pre-bathing. This research examined the immediate impacts of a guava leaf extract body cleansing spray (GBS) on microbial reduction and anti-perspiration post-exercise based on gender.

Methods GBS was employed according to the modified BS EN 1276:2009 method to determine the reduction in microorganism viability. The anti-perspiration tests with GBS compared to non-treatment (CON) were conducted with 21 male and 41 female participants who underwent two experiments with a 7-day washout period. In each experiment, after a 5-minute 75% heart rate reserve exercise on a treadmill using the modified Bruce protocol, perspiration was collected while the participants rested for 20 minutes.

Results The study of product efficacy in a clinical microbiology laboratory on microorganism viability reduction, using the Modified BS EN 1276:2009 method, shows that GBS has passed the reduction in microorganism viability test in 3 strains of bacteria, equivalent to 0.5% chlorhexidine. It also passed the test and demonstrates better efficacy than 0.5% chlorhexidine in decreasing the viability of Enterococcus hirae. In terms of the participants' antiperspirant experiment, GBS significantly decreased post-exercise perspiration levels in males compared to females ($p < 0.05$). Additionally, the GBS test was also significantly more effective at reducing sweat secretion in males than in the CON test ($p < 0.05$).

Conclusion This study has demonstrated that GBS is an effective body cleansing product for promoting hygiene post-exercise in both men and women. Additionally, it can aid in managing excessive sweating secretion in men and individuals with hyperhidrosis.

HP-P-7

Research critique on "a qualitative description of graduate students' perceived decline in physical activity from undergraduate school"

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Background/Purpose Exercise has consistently been advocated, particularly among college students, to promote lifelong engagement in healthy lifestyles. Despite physical activity being promoted through various programs aimed at student well-being, a sedentary lifestyle remains prevalent, particularly among graduate students. These students seem to be especially affected by this phenomenon. The study by Jett et al. (2024) aimed to explore the lived experiences of graduate students from their undergraduate to post-graduate years, focusing on environmental and lifestyle factors.

Methods A qualitative, phenomenological design was employed to identify themes from 21 participants, all aged 18 and above, who were recruited through convenience sampling. Additionally, quantitative measures were incorporated to complement the frequency of the identified themes.

Results The findings revealed a decline in perceived physical activity among graduate students, particularly in the domains of occupational, active transport, and leisure-time physical activity, while household physical activity showed an increase. These findings were associated with themes such as increased academic and occupational responsibilities, changes in physical and social environments, heightened awareness of health and activity, and life transitions.

Conclusion The insights from this study suggest the potential benefits of implementing interventions like the Exercise is Medicine – On Campus (EIM-OC) program to encourage daily physical activity among both undergraduate and graduate students. However, some limitations were noted, particularly regarding the participants' backgrounds, including occupation, age, institution, and demographic diversity. A longitudinal study could provide a more comprehensive understanding of the changes in physical activity from undergraduate to graduate years. Despite these limitations, the study effectively assessed the lifestyle of these students, provided valuable insights into the lifestyle changes faced by graduate students, and offered a foundation for initiatives aimed at encouraging active lifestyles.

HP-P-8

Research critique on "perceived physical education instructor's autonomy support to students' university engagement: deciphering an unexplored issue in the case of a state university in the Philippines"

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Background/Purpose Autonomy-supportive teaching, which emphasizes student choice and decision-making, is crucial in fostering motivation and engagement, particularly in physical education (PE) where developing lifelong fitness habits is essential. Despite its recognized importance, there is limited research on its direct impact in university settings, particularly in the Philippines. This study, conducted by Lobo et al. (2023), aimed to examine the influence of perceived autonomy support from PE instructors on student engagement at Bulacan State University, addressing a significant gap in current educational literature.

Methods The study was grounded in Self-Determination Theory, which posits that autonomy, competence, and relatedness are essential for fostering intrinsic motivation. A total of 702 first- and second-year students from Bulacan State University participated in the survey. Two instruments were used: the Learning Climate Questionnaire to measure perceived autonomy support from instructors, and the Utrecht Work Engagement Scale to assess student engagement. The data were analyzed using multiple linear regression to examine the predictive relationship between perceived autonomy support and engagement.

Results The findings revealed that perceived autonomy support from PE instructors significantly predicted student engagement overall [$F(1,700) = 102.838$, $p < .001$]. This relationship was particularly strong in the engagement dimensions of dedication and absorption. Both instruments demonstrated high reliability, with Cronbach's Alpha values ranging from .76 to .95, supporting the validity of the results.

Conclusion The study concludes that autonomy-supportive teaching in PE significantly enhances student motivation and engagement, which is vital for promoting active participation in physical activities and fostering long-term health behaviors. However, the study's scope was limited to a single university, and further research across diverse educational contexts is recommended. Future studies should consider qualitative methods and longitudinal designs to explore the long-term impact of autonomy support on student engagement and educational outcomes.

Research critique on "you get to…" a qualitative study of perceived influence of physical activity and sport on mental wellbeing among adolescent girls

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Background/Purpose Engaging physical activity is essential for preventing mental health concerns such as anxiety and depression. Research suggests that although there are psychological benefits to physical activity, its impact on adolescent mental health remains uncertain. The study by Murphy et al. (2022) sought to investigate the effect of physical activity on mental and overall wellbeing.

Methods Using qualitative methods, ten participants from a school-based intervention participated in two focus groups, aged 12-14 involved in team sports, from an all-girls Catholic voluntary secondary school in the South East of Ireland. The study used a semi-structured interview guide and audio-recorded the focus groups for analysis.

Results The study found that adolescent girls perceived physical activity and sports as beneficial to their mental well-being, enhancing feelings of autonomy, competence, and relatedness. Key results included improved mood, stress relief, self-confidence, and social connections through participation in physical activities. The girls emphasized the importance of enjoyment, progression, and opportunities for social interaction. However, researchers also identified barriers such as body image concerns and social pressures.

Conclusion These insights suggest that fostering autonomy and social engagement in physical activities is crucial for promoting mental wellbeing. Although the study provides valuable insights into the perceived benefits of physical activity on adolescent's mental wellbeing, it faces limitations due to its small sample size and potential bias. Expanding sample diversity, integrating quantitative data, and using longitudinal methods is recommended to strengthen its validity.

HP-P-10

Review on the effects of mirros on physical activity: focusing on psychological, behavioral, and physiological outcomes

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Background/Purpose The effect of mirrors on physical activity has been explored in numerous studies, focusing on psychological, behavioral, and physiological outcomes.

Methods This review investigated the impact of mirrors on exercise performance, motivation, and self-perception across different types of exercise and experience levels using literature review.

Results Mirrors significantly improved movement precision and posture in strength and balance exercises, particularly among novice exercisers. Participants in mirrored conditions displayed higher muscle activation during resistance training and better balance in yoga, with no significant effect on cardiovascular exercise. However, self-conscious participants, particularly novices, reported higher anxiety and reduced enjoyment, especially in activities emphasizing appearance, such as yoga. Mirrors enhanced performance in exercises requiring precise movements and body alignment, such as strength training and yoga. However, they had limited effects on cardiovascular exercises and negatively impacted individuals with low body confidence. This duality suggests that while mirrors are a valuable tool for improving technique and motivation, their use should be tailored to the individual's experience level and psychological comfort. Mirrors improve exercise performance in tasks requiring technical precision and balance but may detract from enjoyment for individuals with body image concerns. Fitness professionals should consider these factors when incorporating mirrors into exercise environments to optimize both performance and well-being. Mirrors play a critical role in improving exercise performance, especially in activities that require precise movements, balance, and coordination. For experienced exercisers and athletes, mirrors serve as an effective tool for refining technique and increasing muscle activation. For beginners, mirrors can accelerate learning but may also trigger body image concerns, which could hinder performance in some cases. Results from related studies will also be presented and discussed during the conference.

Conclusion These studies provide further insights into the role of mirrors in enhancing exercise performance, motivation, and technique across various exercise modalities and participant populations.

EXERCISE AND SPORTS BIOMECHANICS / HUMAN MOVEMENT / SPORTS MEDICINE

(BM)



BM-P-1

Effects of different weighted vest loads on lower limb muscle coactivation during squats

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Background/Purpose A weighted vest (WV) is widely used in training to improve strength and athletic performance. However, the effect of WV training on lower limb muscle coactivation is still not fully understood. This study aimed to investigate the effects of different WV loads on lower limb muscle coactivation during squats.

Methods Twenty-five healthy male participants performed dynamic squats under three conditions: no additional weight (No WV), with WV equal to 10% of body weight (WV10%), and with WV equal to 20% of body weight (WV20%). Surface electromyography data were collected from six muscles: gluteus maximus, rectus femoris, vastus medialis, vastus lateralis, semitendinosus, and biceps femoris. The muscle coactivation was calculated using the time-varying multi-muscle coactivation function. The statistical analysis was performed using one-dimensional statistical parametric mapping and one-way repeated measures ANOVA.

Results A one-way repeated measures ANOVA revealed significant differences in lower limb muscle coactivation across WV conditions ($F(2,48) = 7.600$, $p < 0.001$). Post-hoc analysis showed that the WV10% condition exhibited significantly higher coactivation compared to the no WV condition ($t = 3.729$, $p = 0.047$), specifically during 45.2-45.8% of the squat cycle. Additionally, significant differences were observed between the no WV and WV20% conditions, with WV20% showing higher coactivation at 34.7-36.8% ($t = 3.768$, $p = 0.019$), 37.6-41.5% ($p = 0.002$), and 42.3-45.1% ($p = 0.010$) of the squat cycle. No significant differences were found between the WV10% and WV20% conditions.

Conclusion The additional loading from the WV significantly influenced lower limb muscle coactivation, particularly during the eccentric phase of the squat cycle. The observed increase in muscle coactivation during WV training may contribute to enhanced joint stability and improved movement accuracy in the lower limbs. These findings suggest that WV training could be effectively applied in both sports rehabilitation settings and athletic training.

BM-P-2

Enhancing long-term biomechanical retention: practitioner insights from neuromuscular training in female runners

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Background / Purpose This study offers critical insights for practitioners—coaches, physical therapists, and trainers—aimed at enhancing long-term biomechanical efficiency and reducing injury risk in recreational female runners. The research explored the retention effects of four distinct neuromuscular training programs—Part Correction Training (PCT), Whole Correction Training (WCT), Part-Whole Correction Training (PWCT), and Whole-Part Correction Training (WPCT)—on contralateral pelvic drop angle (CPDA) and running economy (RE).

Methods Thirty-two female runners completed a 4-week training intervention followed by a 4-week retention phase, with assessments conducted at 1-week, 2-week, and 4-week intervals post-training. The PCT group received audio-visual feedback during single-leg squats (SSLS), while the WCT group received feedback during running. The PWCT group started with SSLS before transitioning to running, and the WPCT group followed the reverse sequence, beginning with running before moving to SSLS.

Results Results demonstrated that WPCT, which prioritized whole-body correction during running before introducing specific part-task correction, was most effective in reducing CPDA and retaining improvements over time. This suggests WPCT optimizes motor learning by initially addressing global movement patterns and later refining specific components, resulting in sustained biomechanical improvements. Additionally, real-time feedback during training significantly enhanced motor skill retention.

Conclusion For practitioners, these findings underscore the importance of integrating whole-body and part-specific corrective exercises in neuromuscular training, starting with general movement corrections and progressing to targeted exercises like SSLS. This approach maximizes long-term retention of proper running mechanics, thereby reducing the injury risks linked to CPD. While no significant gains in RE were observed, the sustained reduction in CPDA highlights the value of WPCT for injury prevention and performance optimization in female runners, recommending its adoption for lasting biomechanical corrections.

Development of an android mobile application for sit-to-stand test

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Background Sit to stand (STS) test commonly uses to evaluate lower limb strength and endurance in the elderly population. The 30-second STS assesses the number of repetitions completed within 30 seconds, while the 5xSTS measures the time required to perform five consecutive STS movements. 5xSTS can be performed by using a stopwatch, which often introduce errors due to human variability. With technological advance particularly in computer vision and machine learning, it is possible to enable the automatic detection of STS movements. Therefore, the purpose of this study was to develop a mobile phone app that can automatically detect STS movements.

Method Nineteen healthy elderly were participated for this study. All participants performed 3 trials of the 5xSTS test, with a 2-minute rest interval between trials A paired t-test did not reveal significance difference of time to complete 5xSTS between the app and 3D motion analysis.

Results The result showed that a novel app is a promising tool for assessing STS performance. This automated feature will help enhance data accuracy and reduce manual timing biases.

Conclusion This study suggest that the developed mobile app can serve as a reliable tool for assessing STS movements. Future developments could extend the app's capabilities to other movement tasks, thereby broadening its applicability in clinical and research settings.

BM-P-4

Characteristics of floating toes in soccer players during the static standing

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Background/Purpose The toes of soccer players are crucial for sprinting, cutting, and kicking. Floating toes, a condition where the toes do not contact with the ground during static standing, can impair motor functions, including postural stability and gait ability. Hence, this condition may impact the athlete's performance. The presence of floating toes in athletes has been reported in a previous study. Nevertheless, there is a lack of evidence for floating toes in soccer players, despite the suggested importance of toe function. So, the aim of this study was to ascertain the characteristics of floating toes in soccer players, investigating the distinctions between dominant and non-dominant feet, playing position, and team level categories.

Methods 134 collegiate soccer players participated in this study. Their floating toe score was evaluated using the foot printing apparatus following the methodology described in a previous study. Participants were classified into three groups based on their score: "Floating toe", "Incomplete contact", and "Complete contact". Data on the dominant foot, playing position, and the team level categorization were collected using a questionnaire.

Results The mean floating toe score for all soccer players was 14.52 ± 4.92 points, indicating "Incomplete contact". In addition, no significant difference in floating toe score was observed between the dominant and non-dominant foot ($p = 0.90$), playing position ($p = 0.90$), and team level categories ($p = 0.64$).

Conclusion The floating toe score of soccer players did not show any differences between the dominant and non-dominant foot, nor between playing position or categories.

BM-P-5

Effects of applied functional training related to running on gastrocnemius muscle activity and foot arch height in distance runners with plantar fasciitis: a pilot study

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Background/Purpose Most exercise programs for the rehabilitation of plantar fasciitis (PF) have focused on stretching exercises; however, there is relatively little research on functional strengthening exercises. This pilot study aimed to investigate the effects of functional strengthening exercises for the calf and foot, in terms of applied functional training related to running (AFTR) on pain during daily activities, gastrocnemius muscle activity, and foot arch height during barefoot running in distance runners with PF.

Methods Fourteen distance runners with PF were randomly allocated into an AFTR group and a control group that followed the traditional PF strengthening program equally. The numeric pain rating score (NPRS) during daily activities was evaluated. Additionally, during the barefoot running trial, muscle activity of the medial gastrocnemius (MG) and lateral gastrocnemius (LG) was assessed using surface electromyography, and foot arch position was measured using infrared cameras and force plates. All evaluations were conducted during both the pre-test and post-test periods. A two-way mixed designed ANOVA was used for analysis.

Results After 8 weeks of training, the AFTR group showed significantly lower NPRS during daily activities ($P = 0.009$). During the stance phase of barefoot running, the AFTR group displayed higher percentage of maximum voluntary contraction (%MVC) for the MG muscle ($P = 0.045$) and lower change of arch height ($P = 0.020$) compared to baseline. When compared to the control group, the AFTR group exhibited significantly lower NPRS during daily activities ($P = 0.044$) and greater %MVC for the MG muscle during barefoot running ($P = 0.026$).

Conclusion Applied functional training related to running may improve medial gastrocnemius muscle function during barefoot running and relieve pain in runners with PF, showing superior results compared to the traditional exercise program for PF. This exercise should be incorporated into the rehabilitation program for distance runners with PF.

BM-P-6

Research critique on “risk of injuries associated with sport specialization and intense training patterns in young athletes: a longitudinal clinical case-control study”

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Background/Purpose Year-round intensive training in a single sport beginning at an early age is increasingly common among the youth athlete population. Studies show, however, that early sport specialization at high intensities and high volume may limit long-term development of young athletes, contributing to increased risks of physical injuries and burnout. While preliminary studies suggest a link between early sport specialization and injury, these lack the longitudinal data necessary to confirm causality. As such, this study by Jayanthi et al. (2020) aims to prospectively determine the relationship between young athletes' degree of sport specialization and their risk of injuries and reinjuries through a longitudinal clinical case-control study.

Methods This study recruited youth athletes, between the ages of 7-18 years old, with either sport-related injuries or those that are uninjured (healthy) from either sports medicine clinics or pediatric clinics. Each participant underwent a baseline survey and an identical follow-up survey every 6 months for 3 years. Baseline survey included an assessment of current sport specialization, while follow-up surveys mainly assess training patterns, and injury types in order to understand the relationship between these variables.

Results Results revealed that more specialized athletes were significantly more likely to incur injuries, particularly overuse injuries, with young female athletes at greater risk. Additionally, athletes who trained more hours relative to their age and had less free play were more prone to injury.

Conclusion While these findings provide valuable insight on the effects of early sport specialization, limitations such as possible changes in sport specialization over time and potential selection bias in follow-up surveys may affect the data's reliability in this study. Moreover, the type of sports in relation to the injury characteristics observed were not described in the study. Addressing these gaps would enhance understanding of sport specialization among youth athletes in relation to injury risk and training patterns.

Effects of racket weight on swing performance of double players in badminton

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Purpose The purpose of this study is to investigate the impact of badminton doubles players using rackets with different swing weights on smash technique, specifically examining the effects on shuttlecock speed, accuracy, and upper limb and trunk kinematic parameters.

Methods Nine elite badminton players participated in the research. Motion analysis was conducted using an 11-camera infrared system with a sampling frequency of 400Hz to capture standing smash techniques. One-Way Analysis of Variance (ANOVA) was employed to compare sports performance and kinematic parameters among doubles players when utilizing different rackets. Descriptive statistics are presented as mean ± standard deviation, with a significance level set at $p < .05$.

Results The results reveal a significant increase in racket head speed for Racket 1 compared to Racket 3. Additionally, both Racket 1 and Racket 2 exhibit a significant rise in the linear acceleration of the racket center compared to Racket 3.

Conclusion In conclusion, doubles players demonstrate enhanced performance with rackets featuring a lower swing weight (101.8 kg-cm²).

BM-P-8

Effect of body position on handgrip strength measurement

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Background Handgrip strength (HGS) is a crucial indicator of muscle strength and overall fitness. Although multiple methods for measuring HGS are available, results may vary based on body positioning. This study aims to evaluate HGS across various body positions.

Methods A total of 671 participants (384 females, mean age 20.5 ± 1.65 years; 287 males, mean age 20.9 ± 1.83 years) were recruited. HGS was measured using a Takai dynamometer (Japan) across six positions: three standing and three sitting. Each position differed by arm placement—arms extended forward, arms extended downward, and arms at a 90° angle. Gender and age differences were analyzed using two-way ANOVA and a post-hoc Bonferroni test.

Results Across genders, HGS varied significantly ($p < 0.001$) between positions. Men exhibited significantly higher mean or maximum HGS ($p < 0.001$). Notable differences ($p < 0.05$) were also observed between standing and sitting positions with the same arm placements. The standing position with the arm extended downward (Canadian position) produced the highest maximal force (34.55 ± 11.59 kg), whereas the sitting position with the arm at 90° (American Society of Hand Therapy protocol) generated the lowest force (30.19 ± 11.05 kg).

Conclusion HGS measurement techniques should be standardized based on the assessment purpose. Results suggest that the American Society protocol is best suited for clinical monitoring, while the Canadian method is more appropriate for athletic evaluation.

BM-P-9

Comparison of lower extremity alignment among taekwondo athletes of various subdisciplines

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Background/Purpose Studies analyzing lower extremity alignment (LEA) LEA among taekwondo subdisciplines athletes are lacking. This study compared LEA in the dominant and nondominant legs intaekwondo athletes.

Materials and Methods Twelve measurements of LEA were analyzed for 157 athletes (63 sparring, 50 demonstration, and 44 poomsae athletes) registered with the Korea Taekwondo Association. LEA was measured in the standing, supine, and prone positions using alignment application, a goniometer, a bubble inclinometer, a height gage, and a palpation meter.

Results The analysis revealed that the dominant leg of poomsae athletes showed greater genu valgum alignment than that of sparring athletes ($p < 0.01$), whereas the dominant leg of sparring athletes showed greater rearfoot varum alignment than that of demonstration athletes ($p < 0.01$). Furthermore, the nondominant leg of poomsae athletes showed greater genu valgum alignment than that of sparring and demonstration athletes ($p < 0.01$), whereas the nondominant leg of sparring athletes showed greater rearfoot varum alignment than that of demonstration athletes ($p < 0.01$). In addition, demonstration athletes had better forefoot varus alignment than poomsae athletes ($p < 0.01$).

Conclusions This study revealed that LEA characteristics vary among taekwondo athletes according to their subdiscipline. The results of this study would help in designing training programs tailored to each subdiscipline that would best address their LEA characteristics and help to prevent injuries. Keywords: taekwondo athletes; lower extremity alignment

SPORTS PERFORMANCE ENHANCEMENT / COACHING AND TRAINING (PE)



PE-P-1

Acute hemodynamic responses to high-intensity interval rowing exercise combined with different blood flow restriction pressures in junior rowers

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Background/Purpose Blood flow restriction (BFR) is a novel technique has been increasingly used to enhance endurance performance in many athletes. To date, there is no consensus on the optimal BFR protocol when combined with aerobic exercise to improve cardiovascular function. Therefore, this study aimed to examine the immediately effect of high-intensity interval exercise (HIIE) at various arterial occlusion pressures (AOP) on hemodynamic variables in junior rowers.

Methods Fourteen youth rowers (11 males and 3 females), aged 15-18 years, from the Rower and Canoeing Association of Thailand and the Rowing Club of Marine Training Center participated in this study. In a randomized crossover design, participants complete 4 HIIE+BFR conditions: HIIE + 40%BFR, HIIE + 50%BFR, HIIE + 60%BFR, and HIIE without BFR, with each session separate by 7 days. The HIIE protocol consisted of sets of 2-minutes rowing interval at power output equivalent to 90%VO_{2max} on a rowing ergometer (Concept 2 D), with a 2minutes of recovery between sets. Hemodynamic variables (cardiac output; [CO], stroke volume; [SV], heart rate; [HR]) were continuously measured using PhysioFlow® (EnduroTM) and analyzed with repeated measure one-way ANOVA.

Results CO, SV, and HR all significantly increased from resting values (all, $p < 0.05$), with no differences observed in maximum and average CO and SV values across conditions. Although the maximum HR values were similar, the average HR value was lower after HIIE + 50%BFR ($p = 0.038$) and HIIE + 60%BFR ($p = 0.012$) compared to HIIE without BFR. The average power output and total distance were lower (all, $p < 0.05$) after HIIE + 60%BFR compared with the other conditions. Moreover, the average pain scale was significantly higher ($p = 0.000$) in all BFR conditions compared to HIIE alone, with the highest value observed after HIIE + 60%BFR.

Conclusion HIIE+40%BFR or HIIE+50%BFR appear to be suitable and safe protocols for prescribing BFR training aimed at improving cardiovascular capacity during rowing in junior rowers.

Correlation between inspiratory muscle strength and critical power in amateur triathletes

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Background/Purpose The objective of this study was to assess whether maximum inspiratory pressure (MIP) and critical power (CP) were significantly correlated in Thai amateur triathletes.

Methods Eight amateur triathletes (aged 31 ± 7 years) participated in this study. MIP was assessed using a hand-held mouth pressure meter. Participants initially completed a ramp incremental cycling test (20 $W.min^{-1}$) until exhaustion to peak aerobic power output (PAP). They then completed constant work rate cycling tests to exhaustion at 80%, 90%, 100%, 110% and 120% of PAP) in randomized order over separate laboratory visits. Individual CP was derived from the prediction trial using linear work versus time model regression analysis. The correlation between MIP and CP was determined using Pearson's correlation coefficient. Statistical significance was accepted when $P < 0.05$.

Results There was no significant correlation between MIP (131 ± 25 cmH_2O) and CP (175 ± 38 W) ($r = 0.461$, $P > 0.05$).

Conclusion Therefore, this study indicates that CP is unlikely to be linked to baseline MIP in Thai amateur triathletes.

PE-P-3

Acute effects of proprioceptive neuromuscular facilitation D2 extended dynamic and static stretching on shoulder range of motion and throwing velocity in collegiate softball players

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Background/Purpose The purpose of this study was to study the acute effect of Proprioceptive Neuromuscular Facilitation D2 extended, dynamic, and static stretching on shoulder range of motion and throwing velocity in collegiate softball players.

Methods Fifteen male softball players from Chulalongkorn University softball club, aged between 18-24 years, were recruited for this study. All of them received 3 types of stretching: Static stretching, dynamic stretching, and Proprioceptive Neuromuscular Facilitation stretching. The interval between each type of stretching was one week. The general physical characteristics, shoulder range of motion, throwing velocity, and throwing acceleration were measured before and after stretching. Dependent variables were analyzed using One–way ANOVA and independent sample t-test. A significance level was considered at $p < .05$.

Results The results showed significant differences ($P < .05$) in range of motion of shoulder adduction and shoulder internal rotation when compared before and after Proprioceptive Neuromuscular Facilitation stretching. Moreover, there were significant differences ($P < .05$) in throwing velocity of shoulder flexion when compared before and after static stretching. In addition, there were no significant differences ($p > .05$) in throwing acceleration.

Conclusion In Conclusion, acute effect of Proprioceptive Neuromuscular Facilitation stretching improved shoulder range of motion more than dynamic stretching and static stretching. At the same time, PNF stretching does not decrease angular velocity and angular acceleration. This indicates that Proprioceptive Neuromuscular Facilitation stretching can be used for male collegiate softball players without a decrease in throwing velocity efficiency.

PE-P-4

Effect of different post – activation performance enhancement (PAPE) protocol on 500-m rowing ergometer and neuromuscular performance.

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Background/Purpose In 500 m rowing, athletes aim to generate maximum power output over a short duration. Post – activation performance enhancement (PAPE) can help improve performance by temporarily enhancing the force production of muscles involved in rowing. However, the available evidence for 500-m rowing ergometer performance in collegiate is scarce. Therefore, the aim of this study was to examine the Effect of different post – activation performance enhancement (PAPE) protocol on 500-m rowing ergometer and neuromuscular performance in collegiate rowing players

Methods 30 healthy rowing trained collegiate men (20.66 ± 0.71 years; 69.85 ± 14.15 kg; 1.68 ± 0.07 m; 24.36 ± 3.69 BMI; 24.41 ± 7.53 % of body fat) volunteered for this study. They randomly performed two different PAPE protocols: general warm-up with rowing machine; and fly-wheel, which consisted of 2 sets of 10 reps of high-pull and biceps curl under the lower inertial loads (0.041kg·m^2), 500-m rowing performance (time, average speed, stroke rate), physiological and bioenergetics parameters (VO_{2max}, [La-]) and neuromuscular performance (dynamics strength index: DSI, grip strength, isometric mid-thigh pull: IMTP and counter movement jump: CMJ) were evaluated at baseline and after 500-m rowing at 4 min either following two difference PAPE condition.

Results Independent t-test analysis indicated that 500-m rowing performance showed no significant differences between two conditions with the [La-¬] was significant higher in fly-wheel warm-up after the race (6.10 + 1.76 vs 7.81 + 1.90 mmol, p=0.01). However, there were no significant difference in neuromuscular performance (DSI, Grip strength, IMTP and CMJ) between both general warm-up and fly-wheel.

Conclusion These findings provide valuable insights into the significance of post-activation performance enhancement in enhancing power output and performance in short-distance rowing. Incorporating PAPE procedures, such as flywheel lifts or explosive movements prior to competition or high-intensity training, may enhance rowers' performance by temporarily enhancing muscle contractility and power output without diminishing neuromuscular function.

PE-P-5

Research critique on "slow breathing for improved performance and recovery"

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Background/Purpose There are a lot of recovery techniques being employed to athletes to facilitate recovery and improve sports performance. Breathing control techniques, also referred to as pranayama (6 breaths a minute), result in an increased activation of the parasympathetic nervous system. The study of Robinson P. (2020) investigated whether a slow breathing intervention technique improves recovery from fatigue after acute exercises that mimics the demands of basketball.

Methods The study used an experimental design with random sampling and is divided into experimental and control groups. Participants (n = 10) completed 4 rounds of a modified lane agility test (MLAT). The experimental group performed slow breathing of 4 seconds inhale and 8 seconds exhale for 1 minute after the MLAT. Data collected are the heart rate, oxyhaemoglobin saturation, RPE, MLAT, and blood lactate.

Results It was seen that the experimental group had a significant effect on performance markers, especially on the blood lactate levels.

Conclusion Despite the findings of the study, it is important to note that there are limitations on the study that needs to be considered. Firstly is the use of a limited number of participants of 10 which may not be representative to a wider population. Additionally, the lack of the use of actual basketball players and the factor of the participant's activity level. Furthermore, the researchers only randomly assigned the participants to either groups which might have failed to limit researcher bias. Overall, the study has provided an insight into looking at breathing techniques that may improve recovery and performance as it suggested preliminary evidence to support the topic.

PE-P-6

Research critique on “high school student-athletes: their motivation, study habits, self-discipline, academic support, and academic performance”

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Background/Purpose This study entails the secondary school into a crucial approach for students to participate in extracurricular activities, enhancing their skills and character. Sports is not only enhanced physical pursuits but also interpersonal, leadership, and character traits. Thus, this study of Pujianto et al. (2024) aims to identify the characteristics of Bengkulu City's secondary school student-athletes, including their study habits, self-discipline, academic support, and academic performance.

Methods A survey approach was employed in this quantitative descriptive study, which included 402 student-athletes from junior high and senior high schools.

Results The result reveals that student-athletes in Bengkulu City has high category in academic performance, self-discipline, study habits, and motivation, with significant differences between male and female athletes (sig $0.001 < 0.005$). It suggests specialized assistance and interventions for better academic experiences.

Conclusions Despite the positive outcomes, statistical methodologies must be accord in the standardized format that improves the quality of data interpretation. Motivation category can be prior to analyze by age/grade level between junior and senior high level that aligns the correct statistical analysis between genders. Independent sample test was not mentioned in the method that causes misunderstood of the finding’s correlation. The statistical differences between individual and team sports needs to have clear implications towards the data. Lack of paper technicality has been evident; it must adhere proper formatting guideline to understand the flow of research paper. Utilizing other research designs could enhance the depth of this study. Indeed, highlighting the potential gaps aim to provide holistic understanding and development for future research conduction.

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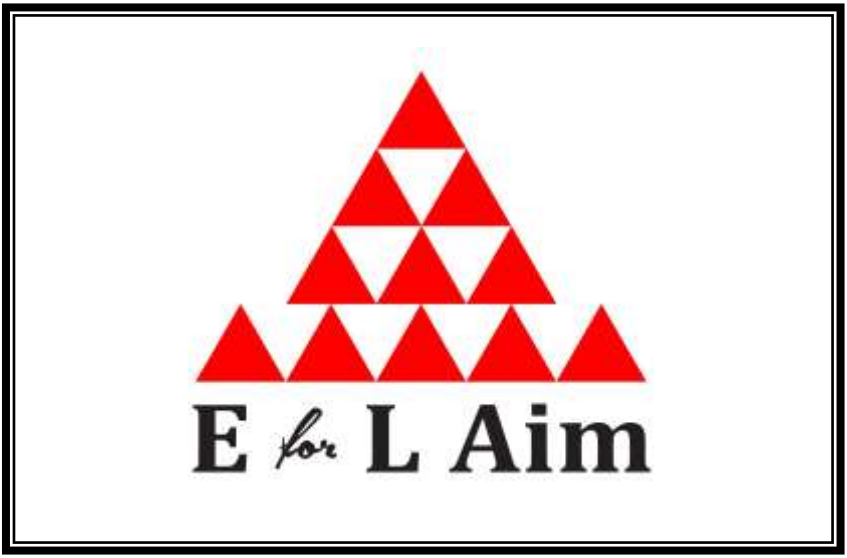
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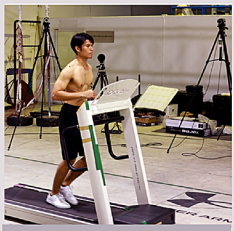

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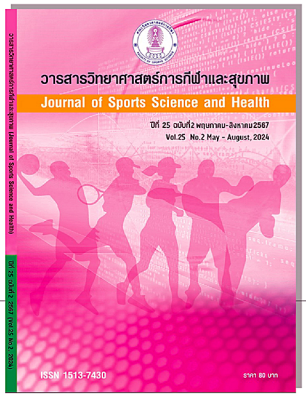

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