



# 2<sup>nd</sup> International Conference on Sports Science and Management 2022/2023



*The Synergy of Sports and Quality of Life:  
Strategies for Achieving Excellence*

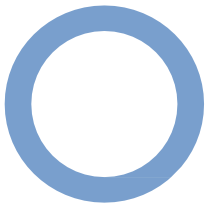


**iCSSM 2022/2023**

**CONFERENCE PROCEEDINGS**

25<sup>th</sup> and 26<sup>th</sup> April 2023

Department of Sports Science  
Faculty of Applied Sciences  
University of Sri Jayewardenepura





iCSSM 2022/2023

**SECOND INTERNATIONAL CONFERENCE ON  
SPORTS SCIENCE AND MANAGEMENT**

*The Synergy of Sports and Quality of Life:  
Strategies for Achieving Excellence*

**Department of Sports Science  
Faculty of Applied Sciences  
University of Sri Jayewardenepura**

**25<sup>th</sup> & 26<sup>th</sup> APRIL 2023**

**Proceedings of the 2<sup>nd</sup> International Conference on Sports Science and Management (iCSSM 2022/2023)**

**25<sup>th</sup> & 26<sup>th</sup> April 2023**

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K. H. K. Keminda, O. R. Senanayake

The 2<sup>nd</sup> International Conference on Sports Science and Management 2022/2023 (iCSSM 2022/2023) is organized by the Department of Sports Science, Faculty of Applied Sciences, University of Sri Jayewardenepura under the theme ***The Synergy of Sports and Quality of Life: Strategies for Achieving Excellence.***

The main objectives of iCSSM 2022/2023 are to provide a platform for Sports Science and Management undergraduates to publish their research findings and facilitate their research engagement in the Sports Science and Management domains.

The material in this publication has been supplied by the authors, and only minor editing, if relevant, have been done by the Editorial Board of iCSSM 2022/2023. The views expressed remain the responsibility of the named authors.



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## CONFERENCE PROGRAMME

### Day 1 – 25<sup>th</sup> April 2023: Inauguration Ceremony

- 10:00 – 10:20      **Inauguration**  
The traditional lighting of the oil lamp  
University Anthem
- 10:20 – 10:30      **Welcome Address**  
Dr. (Ms.) S. Weerasinghe  
Chair – iCSSM 2022/2023, Head, Department of Sports Science
- 10:30 – 10:45      **Address by the Acting Vice-Chancellor, University of Sri Jayewardenepura and Dean, Faculty of Applied Sciences**  
Professor S. M. C. U. P. Subasinghe
- 10:45 – 11:05      **Address by the Chief Guest**  
Dr. Seevali Jayawickreme  
Director General, Sri Lanka Anti-Doping Agency
- 11:05 – 11:50      **Keynote Address**  
Dr. Linda H Chung  
Coordinator of Master's in High Performance Sport: Strength and Conditioning at UCAM Universidad Católica San Antonio de Murcia, Spain
- 11:50 – 12:00      **Vote of Thanks**  
Ms. A. M. G. C. P. Adikari  
Convener / Secretary – iCSSM 2022/2023
- 12:00 – 12:04      **National Anthem**

### Day 2 – 26<sup>th</sup> April 2023: Technical Sessions

- 09:00 – 13:00      **Technical Sessions**

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Ms. M. H. Kumaramage	University of Sri Jayewardenepura, Sri Lanka

## **Message from the Acting Vice-Chancellor, University of Sri Jayewardenepura and Dean, Faculty of Applied Sciences**



I extend my warmest wishes to the participants and the organizing committee of iCSSM 2022/2023.

Establishing a conducive research environment while encouraging undergraduates to conduct high-quality, impactful research leading to scholarly publications and innovations has been a priority of the University of Sri Jayewardenepura as well as the Faculty of Applied Sciences. In this context, I am happy to see that the Department of Sports Science has taken the initiative to inspire its undergraduates to conduct quality research by providing a unique platform for publishing their research findings. Furthermore, I am pleased to witness that the Department of Sports Science is moving forward aligning with the Vision of the University of Sri Jayewardenepura and the Mission of the Faculty of Applied Sciences.

This conference may not only help sharpen the analytical skills of Sports Science and Management undergraduates but also promote networking with foreign intellectuals with subject expertise. The conference will be a great opportunity for young researchers to share new knowledge and experience while making an impact on society by devising solutions for contemporary issues in the domains of Sports Science and Sports Management.

I would like to express my sincere gratitude to the organizing committee of iCSSM 2022/2023. I am confident that your collective effort will pave the way to enrich the collaborative research culture within the university.

I wish all participants a fruitful conference experience!

**Prof. Upul Subasinghe**

Acting Vice-Chancellor, University of Sri Jayewardenepura

Dean, Faculty of Applied Sciences, University of Sri Jayewardenepura

## Message from the Chair of iCSSM 2022/2023



I am delighted to welcome you to the 2<sup>nd</sup> International Conference on Sports Science and Management (iCSSM 2022/2023) organized under the theme of ‘**The Synergy of Sports and Quality of Life: Strategies for Achieving Excellence**’.

From the inception of the Sports Science and Management degree programme back in 2013 and the establishment of the Department of Sports Science in 2017, we have been moving forward with the vision of achieving academic excellence, and iCSSM marks a remarkable milestone in this journey. iCSSM 2022/2023 was organized to provide an opportunity for the undergraduates of the Sports Science and Management (SSM) degree programme to publish their research work. Around 35 SSM undergraduates are presenting their final-year research findings at iCSSM 2022/2023, and this footstep is an initiative toward developing a research culture within the Department of Sports Science.

Being a young department with a young staff, organizing a research symposium of this calibre is challenging. The organizing committee of iCSSM 2022/2023 is grateful to the Keynote Speaker Dr. Linda H. Chung, UCAM Universidad Católica San Antonio de Murcia, Spain, and the Chief Guest Dr. Seevali Jayawickreme, Director General, Sri Lanka Anti-Doping Agency for their invaluable contribution toward the success of this conference. Further, we sincerely acknowledge the AHEAD ELTA-ELSE Development Project of the Department of Sports Science for providing funds for iCSSM 2022/2023 to enhance the analytical competencies of undergraduates. On behalf of the organizing committee, I also wish to express my sincere gratitude to all reviewers, panel members and student volunteers for their immense support rendered to make this event a success.

I hope that iCSSM 2022/2023 will be a productive experience for all the participants.

**Dr. (Mrs.) S. Weerasinghe**  
Conference Chair, iCSSM 2022/2023  
Head, Department of Sports Science



## Message from the Secretary of iCSSM 2022/2023



It is a great privilege to write a message for the proceedings of the second International Conference on Sports Science and Management (iCSSM 2022/ 2023) organized by the Department of Sports Science (DSS), University of Sri Jayewardenepura (USJ) as the conference secretary and the convener. The iCSSM 2022/2023 is organized under the theme of *“The Synergy of Sports and Quality of Life: Strategies for Achieving Excellence”* and it marks a remarkable milestone for the Department of Sports Science where our undergraduates receive a platform to publish their multidisciplinary research in an international conference.

The iCSSM 2022/2023 is funded by the AHEAD ELTA-ELSE development project for DSS and its primary intention is to develop undergraduate research and improve research culture among students.

I must acknowledge the support rendered by scholars around the globe in different capacities to enrich the iCSSM 2022/2023 as reviewers. To add colour to the conference, round table discussion with alumni members on the Sports Science Applications & Career Pathways, and an Industrial Forum themed ‘Sports Tourism’ is scheduled parallel to the iCSSM 2022/2023 which provides a great opportunity for the undergraduates to share possible connections with the sports industry. As a pioneer of sports education in Sri Lanka, DSS recognize the importance of research and analytical interventions to overcome the barriers in the Sri Lankan sports field.

Hence, the iCSSM will feed the required knowledge to fill up the gap. Finally, I would like to express my gratitude to the Acting Vice-Chancellor/Dean, chief guest, keynote speaker, reviewers, panel members of the technical sessions, academic, administrative, and non-academic staff members of the DSS and USJ, director and the staff of the AHEAD team, and well-wishers who helped us in different ways to make iCSSM 2022/2023 from a concept to a successful reality.

**Mrs. A. M. G. C. P. Adhikari**  
Conference Secretary, iCSSM 2022/2023

## Message from the Chief Guest of iCSSM 2022/2023



It was an honour and a pleasure to be the Chief Guest at the 2<sup>nd</sup> International Conference on Sports Science and Management 2022/2023 and I am grateful to the organizing committee of the Department of Sport Science of the Faculty of Applied Sciences of the University of Sri Jayewardenepura, for giving me this opportunity.

Although Sports Science and Sports Management are not unfamiliar academic areas for most countries, this study area was introduced to the Sri Lankan tertiary education system recently. Despite several challenges, I wish to appreciate and congratulate the Department of Sport Science of the Faculty of Applied Sciences, University of Sri Jayewardenepura for leading the research in sports to the international stage.

Sports Science and Management are vital components of any society for enhancing everyone's health and happiness while instilling pride in one's country and extending friendships both locally and worldwide.

Sports engagement should not be restricted to a competitive level as recreational sports participation enhances the overall health of everybody. Sports are now widely acknowledged as medicine. Sri Lanka is currently in a vulnerable position in Asia regarding the morbidity and mortality rates of several non-communicable diseases. Sports Science graduates should take the front position to increase awareness of the general community on the role of sports and exercise in reducing the risk of non-communicable diseases.

While giving that message, I would like to compliment the organizing committee of the 2<sup>nd</sup> International Conference on Sports Science and Management and wish the presenters and the participants a very successful and impactful conference experience.

**Dr. Seevali Jayawickreme**

The Director General, Sri Lanka Anti-Doping Agency

## KEYNOTE ADDRESS



### **Multiple Sclerosis: Exercise for a Better Quality of Life**

Dr. Linda H. Chung, PhD

UCAM Universidad Católica San Antonio de Murcia,  
Spain

It is a great honour to kick off this congress that is focused on the Synergy of Sports and Quality of Life: Strategies for Achieving Excellence with this keynote lecture on Multiple Sclerosis: Exercise for a Better Quality of Life.

According to the World Health Organization, “quality of life” is an individual's perception of their position in life in the context of the culture and value systems in which they live and their goals, expectations, standards, and concerns. So, Quality of Life (QoL) is quite complex. There are many aspects to consider: health, cultural factors, social relationships, economic status, our environment, and our functional skills (i.e., work status). Now these are things that a healthy person must perceive to gauge their QoL.

But what about QoL with chronic disease? Now the health status becomes the protagonist. Perhaps comfort also plays an important role and can eventually affect our level of happiness. But what might allow us to control (to a certain degree) the QoL with chronic disease is exercise. Numerous studies have been published about the benefits of exercise in a healthy population (both young and old), in patients' recovery from some kind of intervention due to injury, as well as in several chronic diseases. Let us focus on one, which is multiple sclerosis.

Multiple sclerosis is an autoimmune disease that affects the central nervous system (CNS), specifically the myelin protein of the nerves. The exact cause is still unknown but can be multifactorial. Its characteristic pathology is the inflammation of the nerves, which damages myelin protein and, in turn, may result in scarring of the affected area.

Inflammation can attack any part of the CNS, albeit the brain, the spinal cord and especially the optic nerve.

To give you a global picture, 2.8 million people are living with MS around the world, and this is according to the data from the Atlas of MS, 3<sup>rd</sup> edition. Not all these individuals are adults, it is reported that 30,000 (1.5%) of them are under the age of 18 years. Overall, 1 in 3000 people in the world is living with MS. And there are twice as many women with MS (69%) compared to men with MS (31%).

People with MS (pwMS) suffer many different types of symptoms, and the symptomatology is heterogeneous amongst pwMS. How does this happen? Well, in a healthy nerve, there is the axon and the myelin sheath that surrounds the axon. There is also the presence of microglia and astrocytes that play important roles in homeostasis, immune response, blood-brain barrier maintenance and synaptic support of the CNS. You can imagine the nerve being a typical electrical wire. The conduction of electrical signals is done by the copper wire (the axon) and the insulator material (myelin sheath) around the copper wire ensuring that the signals get to their destination in a fast and efficient manner. In MS, it is observed that infiltrating immune cells from the periphery infiltrate the blood-brain barrier and the glial cells become activated, which leads to the T cells and macrophages reacting against the myelin protein. Consequently, we have an interruption of nerve conduction due to the myelin damage/resultant scarring and there is undesired communication between the nerves. This then translates into the appearance of symptoms.

The symptoms of MS include numbness and tingling, cognitive dysfunction, depression, dizziness, vision problems, pain, bladder and bowel dysfunction, fatigue, muscle spasms, muscle weakness and walking difficulty. The symptomatology, or set of symptoms, varies among pwMS depending on where the nerve damage occurs and how many sites are affected. Thus, the quality of life is tremendously affected.

There are pharmacological (oral and injectable) treatments that can modify the course of the disease, reduce the number of outbreaks/relapses and slow down the progression of disability. There are also a wide variety of treatments available to alleviate many of the symptoms that affect the quality of life. This is all well and good, but is there a non-pharmacological alternative that can help slow or delay the progression of symptoms? That is, to improve the ability to perform daily activities? Yes, like other diseases,

physical exercise may be the treatment to improve the health status and quality of life of this population. And most importantly improve the capacity to do day-to-day activities.

But I should note that for many years, the medical community has had controversial opinions about the use of exercise as a treatment for MS, even though since the mid-19<sup>th</sup> century, case reports have suggested that exercise can benefit pwM. However, others believed exercise could be potentially harmful and could negatively affect the progression of the disease. Luckily for us, we have many clinical trials that have been performed, and we know for a certainty that exercise is safe and can be performed by pwMS.

Recently, we did a systematic review on the effectiveness of aerobic training on cardiorespiratory fitness, functional capacity, balance, and fatigue in pwMS. Out of the 43 studies that were included, 26 were randomized control trials (RCT). Just to give you an overview, the average age was 46 years, the disease severity was low-to-moderate based on the Expanded Disability Status Scale (EDSS) and the aerobic training ranged from 2-48 weeks, with a frequency of 2-5 sessions per week, intensity ranged from self-selected to high and the exercises were either treadmill walking lower or upper limb cycling. The training was either continuous or intervallic. Within-group analysis showed that only the aerobic training (AT) group showed improvements in cardiorespiratory fitness, timed up-and-go (TUG), gait speed, walking endurance, balance and fatigue.

However, when we examine the forest plots created by the meta-analysis, we see that the overall effect of AT was not significant on cardiorespiratory fitness compared to the control group. The lack of difference in cardiorespiratory fitness between groups may be due to the large variety of programs used (intensity and duration). Another thing to consider is that lower cardiorespiratory fitness may be due to the nature of the neurological disorder (lower central motor commands or impairments in the autonomic nervous system).

In line with the cardiorespiratory data, we see that the overall effect of AT on fatigue and TUG were not significant. However, we do see an effect favouring AT in balance, gait speed and walking endurance compared to control. We still need more long-term AT interventions to see if some of these nonsignificant data do improve over a longer period.

What about resistance training? We conducted another systematic review and meta-analysis examining the effects of resistance training on strength, functional capacity, balance, general health perception and fatigue in pwMS. We included 44 studies of which we had 44 resistance training groups and 22 control groups. The resistance training programs ranged from 4 to 24 weeks, with a frequency of 1 to 5 sessions per week. The intensity of the exercise was low to high, including the use of body weight itself. The exercises were done on machines with elastic bands or even with their body weight. We saw again in the within-group analysis that the intervention group improved in strength, functional capacity, balance and fatigue, but not in the physical health status of MS. Forest plot data show an effect favouring resistance training in knee extension and knee flexion strength, but not in 1-RM, compared to controls. For the measurements of physical function, mobility, and balance, we see a clear effect favouring resistance training. However, there was no significant effect of resistance training on fatigue and physical health status when compared to controls. Overall, based on these results, we can say that resistance training is a valid strategy to improve strength and functional capacity in pwMS.

Now, aerobic and resistance training are common practices. But are there alternative modes of training that pwMS can perform? One possible alternative could be whole-body vibration training. Why? Because in practice, an individual could work with less volume, perhaps helping to maintain fatigue levels, and could receive the same benefits as strength training.

So how does the vibration platform work? An individual stands on a platform in an instructed position (typically with some degree of knee flexion) and, depending on the machine, the platform vibrates vertically or in an oscillatory manner. In general, the biomechanical response is the same for both types. The platform emits a forced oscillation, where energy is transferred from the platform to our musculoskeletal system. Then, the resonance or energy that is generated by the platform propagates through the body. Our biomechanical response is to dampen the resonance or energy that propagates towards the head. The vibration is damped by the soft and rigid parts of the body, including our joints, so that the farthest part, the head, receives a particularly weak signal.

In addition, we have a physiological response which involves the tonic vibratory reflex, which is the reflex that activates the agonist muscle and relaxes its antagonist. The

vibration damping will also depend on the neuromuscular response sent by the receptors of the muscle spindles, the sensitivity of the joint and skin receptors, as well as the proportion of the type of muscle fibres and viscoelastic elements that determine the stiffness.

WBVT produces neuromuscular adaptations, such as increased neuronal excitability, increased body temperature and blood flow, increased hormonal secretion and improved spinal circuits in adults. This type of training has been applied in numerous studies with pwMS. In a systematic review in 2018, we observed that only 5 of the 9 included studies showed benefits in strength, coordination, balance, endurance, functional mobility, pain, and spasms.

In a meta-analysis done by Kantele et al. in 2015, observed that 2 of the 7 RCTs showed improvements in walking endurance. In addition, no effect of WBVT was observed in measures of TUG, walking speed, balance and walking endurance compared to controls, as we see here in these forest plots.

Well, so far there seems to be a bit of controversy about the benefits of vibration training. On the one hand, these systematic reviews have seen improvements in strength and variables on physical function and pain. But on the other hand, some studies saw no significant differences. This controversy in the literature may be due to the lack of methodological quality of these studies (e.g., non-randomized control trials, lack of blinding and questionable allocation concealment). There is also quite a bit of variability in the WBVT protocols (e.g., intensity, duration, and exercises). Thus, more RCT studies are needed to examine the effects of WBVT in pwMS.

Recently, with the advancement of recreational technology, exergaming has been considered a viable training method for older adults and people with chronic diseases. In a study by Tollar et al. In 2020, they had three different intervention groups: exergaming, cycling and balance compared to two control groups (proprioceptive neuromuscular facilitation – active control and no-intervention control). What they found was that, in addition to cycling and balance training, exergaming especially showed significant improvements in the physical and psychological parameters of MS (MSIS-29), health-related QoL (EQ5-SUM), walking endurance (6MWT) and static balance with eyes open (COP). In addition, they observed that changes in QoL and changes in MS impact physical and psychological functions correlated with one another

only in the EXE group. This evidence suggests that exergaming can be a viable method to improve clinical and motor symptoms and quality of life in pwMS.

So, we can ask ourselves, what is the most effective exercise to lessen the severity of the symptoms in pwMS? The answer is quite complex Who can exercise and what type of training is appropriate? It depends highly on the level of disability of a pwMS. Most studies have investigated mobile pwMS. Fewer studies have looked at people who need assistive devices and almost nothing has been done on people who are confined to a wheelchair or confined to bed.

Ultimately, we want to improve the QoL of these individuals affected by chronic disease. To do this, we need to maintain their day-to-day activities. And by doing this we need to (in my opinion) focus on muscle strength as the foundational benchmark. We need to work on both neural and muscular adaptations...so that this can translate into better physical function and mobility and eventually a better QoL.

The overall mission is to have the capacity to overcome obstacles (symptomatology) and to improve the QoL in an individual. Physical exercise is the most economical and non-pharmacological approach to doing this and can certainly complement medical treatments.

Thank you for your attention.



## CONTENTS

<b>ABSTRACTS</b>	<b>1</b>
<b>TRACK 1: SPORTS PSYCHOLOGY</b>	<b>2</b>
101 Smoking, Alcohol Consumption, and Illegal Substance Usage Among University Athletes and Non-Athletes	3
102 Impact Of Being in a Bio-Bubble on Sleep Quality of National Football Players During Covid 19 Pandemic	4
103 The Relationship Between Physical Activity Level and Selected Psychological Variables Among Sports Science Undergraduates During the COVID-19 Pandemic	5
104 Determining the Barriers Faced by Female Students for Sports Participation in Jaffna District	6
105 Does Mental Fatigue Impair Physical Performance in Healthy Active People? A Systematic Review	7
106 The Effect of Selected Psychological Factors on the Performance of Top-Ranking Tennis Players in Sri Lanka	8
107 The Relationship Between Physical Activity Levels and Stress Among Baseball Players During the COVID-19 Pandemic	9
108 Mental Toughness and Success in Sports: A Study of Weightlifters in Northern Province	10
109 Exercise Behavior Among Sri Lankan Undergraduates	11
<b>TRACK 2: SPORTS MARKETING, SPORTS TOURISM, SPORTS FACILITY DESIGN, SPORTS ORGANIZATIONAL BEHAVIOUR, SPORTS LEADERSHIP</b>	<b>12</b>
201 A Survey to Explore User Perception on Attributes of Urban Walking Trails	13

203	The Impact of Local Food Culture on Choosing Sri Lanka as a Destination for Marine and Coastal Sports Activities	14
204	Environmental Concern and Consumers' Purchase Intentions of Buying Green Products: A Study Considering Green Buying Behaviour of Sports Science and Management Undergraduates of the University of Sri Jayewardenepura	15
205	A Study of Cognitive State Anxiety Leading to Psychological Disorders of Sri Lankan Kabaddi Players Suffering from Injuries	16
206	Role of Sports in Tourism Development of Sri Lanka	17
207	Factors Affecting Green Buying Behaviour of National Athletes in Sri Lanka	18
208	Determinants of the Athletes' Perceived Performance in 1AB Schools in Kekirawa Zone in North Central Province in Sri Lanka	19
209	Online Purchase Intention of Sri Lankan Consumers for Sports Goods and Apparels: An Approach of the Model of Goal-Directed Behaviour	20
210	The Impact of User-Generated Content of Facebook on the Behavioural Intention of Domestic Sports Tourists with an Emphasis on Sports Tourist Destinations in Sri Lanka	21
211	The Relationship Between Coaches' Leadership Styles and Team Cohesion Among Sri Lankan Male Basketball Players	22
212	The Relationships Between Psychological and Sociological Factors and Sports Performance of the Athletes at the University of Sri Jayewardenepura	23
	<b>TRACK 3: TRAINING METHODS, SPORTS BIOMECHANICS, GENERAL THEORY OF SPORTS TRAINING</b>	<b>24</b>
301	The Effect of Callisthenics Strength Training on Arm Power, Core Strength, and Leg Power of School-Level Football Players	25
302	A Biomechanical Analysis of Direct Free Kicks in Sri Lankan Football Players	26

303	A Biomechanical Analysis of the Grab and Track Swimming Starts of Sri Lankan School-Level Swimmers	27
304	Effect of a 12-Week Fitness Training Programme on Physical Fitness of National-Level Kabaddi Players in Sri Lanka	28
305	Body Image Perception and Supplement Usage Among Weightlifters, Bodybuilders, and Powerlifters in Sri Lanka	29
	<b>TRACK 4: EXERCISE PHYSIOLOGY, SPORTS INJURIES, SPORTS NUTRITION, DOPING IN SPORTS</b>	<b>30</b>
401	The Knowledge and Attitudes of the Tri Forces Wrestlers on Dietary Supplements in Sri Lanka	31
402	The Effect of Core Strength and Stability on Upper Body Power Output: A Narrative Review	32
403	The Effect of Dietary Habits on Menstrual Cycle Irregularities of Female Athletes at the University of Sri Jayewardenepura	33
404	The Effect of Body Fat Percentage and Core Strength on Agility of Sri Lankan National-Level Squash Players	34
405	The Effect of Physical Activity Level and Eating Habits on the Prevalence of Overweight and Obesity Among the Workers of Britannia Garment Packaging, Sri Lanka	35
406	The Influence of COVID-19 Lockdown Restrictions on Discerned Dietary and Training Habits of Sri Lankan National-Level Racquet Sports Athletes	36
407	The Effect of Nutrient Intake During the Anabolic Phase on Delayed Onset Muscle Soreness of National-Level Wheelchair Athletes	37
408	An Analysis of the Body Composition and the Bowling Speed of Sri Lankan Fast Bowlers	38
409	Perceived Performance and Knowledge Regarding the Menstrual Cycle of Female Athletes at the University of Sri Jayewardenepura	39

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## **ABSTRACTS**

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**TRACK 1  
SPORTS PSYCHOLOGY**

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## **Smoking, Alcohol Consumption, and Illegal Substance Usage Among University Athletes and Non-Athletes**

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With financial, political, and cultural changes that occurred after the Industrial Revolution, people have tended toward the habits of smoking, alcohol consumption, and illegal substance usage. Currently, tobacco and alcohol products and illegal substances represent a significant part of the world economy and there are many negative consequences of these products on humans. The main objective of this study was to identify the differences between the behaviour of university athletes and non-athletes regarding smoking, alcohol consumption, and illegal substance usage. This cross-sectional survey was conducted using 200 male university students who were selected using a purposive sampling method. Data were gathered using a self-administered questionnaire developed by the World Health Organization (WHO) for drug usage. The collected data were analysed using SPSS version 21.0 software. The Chi-square test was used to determine the significant associations between smoking, alcohol consumption, and illegal substance usage of athletes and non-athletes. According to the results, 44% of the athletes and 34% of the non-athletes have smoked, chewed, or sniffed any tobacco products. Moreover, 62% of the athletes and 62% of non-athletes have consumed alcoholic beverages including beer and wine. Among the participants, 23% of the athletes and 19% of the non-athletes have used cannabis at least once in their lifetime. The results proved that a considerable number of athletes are smoking and using illegal substances than non-athletes. This is an alarming finding for the sports field and authorities should conduct surveys focused on the athletes from different sports. Smoking, alcohol consumption, and illegal substance abuse by undergraduates remain a concern in Sri Lankan universities, and it is recommended to conduct a health promotion intervention programme to tackle this issue.

**Keywords:** Smoking, Alcohol, Illegal substance, University students

## The Impact of Being in a Bio-Bubble on Sleep Quality of National Football Players During the COVID-19 Pandemic

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Sleep is a crucial component of physical and mental health and is essential to sports performance. Research has revealed that lack of sleep, sleeping more frequently for short periods, staying up late and rising early have an impact on the physical performance and mentality of individuals. However, the extent of its impact varies from location to location and person to person. Even though there is a growing body of research on the varying effects of the COVID-19 outbreak on mood, loneliness, and sleep quality, less attention has been paid to the impact of the bio-bubble concept on sleep quality during the COVID-19 pandemic. The study aims to identify the effects of bio-bubble on the sleep quality of national football players in Sri Lanka. This cross-sectional study design was conducted for six weeks from the 1<sup>st</sup> of October to the 12<sup>th</sup> of November 2021. A total of 46 national male football players who participated in a bio-bubble were included in the study. The sleep quality of the participants was measured using the Pittsburgh Sleep Quality Index (PSQI), and COVID-19 fear was measured by Fear of COVID-19 (FCV-19S). Sleep quality was considered poor if the global score was  $\geq 5$ . The collected data were analyzed using SPSS version 23.0. Spearman rank correlation coefficient test was conducted to determine the relationship between the fear of COVID-19 and the sleeping quality. Results revealed that 95.7% of the participants have average to good sleep quality and 4.3% of the participants are suffering from low sleep quality. Fear of COVID-19 among the participants showed an average level of  $16.39 \pm 2.90$ . According to the Spearman correlation test results, there was no significant relationship between the fear of COVID-19 and sleep quality ( $p=0.216$ ,  $r=0.186$ ). This population-based study reveals that during the COVID-19 outbreak, the bio-bubble had no impact on the quality of sleep among national men's football players. Further research is required to support these initial findings.

**Keywords:** Sleep quality, Pittsburgh Sleep Quality Index, National football players, COVID-19 Pandemic

## **The Relationship Between Physical Activity Level and Selected Psychological Variables Among Sports Science Undergraduates During the COVID-19 Pandemic**

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The inclination towards the various psychological disorders among Sri Lankan university undergraduates is getting increasingly comprehensive. Among them, Sports Science undergraduates are considered a significant category who engaged in both competitive sports and studies. Therefore, the major objective of this study was to find the relationship between perceived stress, anxiety, and physical activity levels among Sports Science undergraduates during the COVID-19 pandemic. A cross-sectional survey was carried out with a sample of 158 undergraduates from two state universities: the University of Sri Jayewardenepura ( $n=85$ ) and Sabaragamuwa University ( $n=73$ ) who offer Sports Science degrees. Data were collected from the purposively selected participants using three standard questionnaires. The International Physical Activity Questionnaire (IPAQ), Perceived Stress Scale (PSS) and Beck Anxiety Inventory (BAI) were distributed after getting their consent. Gathered data were analysed using SPSS software. The results revealed that 84.2% of the participants engaged in vigorous levels of physical activities, 89.9% of the participants had a moderate level of perceived stress, and 52.5% of the participants were suffering from a moderate level of anxiety regardless of gender, year of study and university. According to the Spearman correlation test, there was no significant relationship between the physical activity level and perceived stress ( $p=0.058$ ,  $r=0.151$ ), and anxiety ( $p=0.623$ ,  $r=0.039$ ). The Mann-Whitney U test revealed that there is a significant difference in physical activity level and the year of study ( $p=0.03$ ). According to the analysed results, it can be interpreted that the COVID-19 pandemic and its related effects led Sports Science undergraduates to refrain from their usual physical activities regardless of the demographic variables affecting physical and psychological well-being.

**Keywords:** Anxiety, Stress, Physical activity level



## **Determining the Barriers Faced by Female Students for Sports Participation in Jaffna District**

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Jaffna is a district in Sri Lanka rich with Tamil traditions, customs, and culture. In modern Jaffna society, female participation in social activities has increased to a greater extent than ever before. Physical activities and sports are essential for an individual's physical, mental, emotional, social, and psychological growth and well-being. The purpose of this study is to investigate the barriers faced by the Jaffna district female students to participate in sports. Accordingly, 187 female students from 40 1AB schools (schools with G.C.E. Advanced Level classes) were purposively included in the present study. Data were gathered using a self-developed questionnaire related to barriers faced by female students in sports participation. Data were analyzed using SPSS version 22.0. Descriptive statistics and percentages were used to interpret the data. According to the participant perception, 18.3 % of the participants avoid participating in sports as they are afraid of getting injured, 21 % declared that they avoid sports as they do not like to wear sports attire, and 15 % of the participants stated that their parents restrict sports participation as it can affect their studies. Furthermore, according to the survey results, factors such as the negative attitude of society regarding sports, demotivating friends and relatives towards sports participation, intensive work tempo, study load, sports uniforms, and lack of access to grounds and restrooms were identified as the barriers that prevent the participants in this study from engaging in sports and physical activities. It can be concluded that most of the female students in the Jaffna district face barriers including psychological, physical, social, and cultural factors that limit their sports participation.

**Keywords:** Female students, Sports participation, Physical activities

## **Does Mental Fatigue Impair Physical Performance in Healthy Active People? A Systematic Review**

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Mental fatigue represents a psychobiological condition caused by prolonged periods of demanding cognitive activity. Recent studies demonstrate that cognitive processes, such as inhibitory or cognitive control, are major factors that are critical in enhancing a high level of physical performance. Under this premise, literature has revealed the potential negative influence of mental fatigue on physical performance in healthy people. The objective of this review was to analyze the potential literature on the impairment of physical performance due to mental fatigue in healthy active people. We performed a systematic literature review in the electronic databases, PubMed, Web of Science, and SPORTSDiscus until 30<sup>th</sup> April 2022, where we searched for original articles to identify whether mental fatigue influenced physical performance after applying different fatiguing tasks. A total of 15 articles were included, of which all were evaluated as high quality with a mean score of  $6.4 \pm 0.8$ . The included studies have observed that mental fatigue influences decreased whole-body endurance and physical performance in healthy active people, and it has been identified where perceived exertion in experimental groups was higher than in the control group. However, it has been identified that the physiological variables related to physical performance such as heart rate, blood lactate concentration, oxygen uptake, cardiac output, and maximal aerobic capacity were unaffected by mental fatigue. Moreover, the impairment of physical performance induced by mental fatigue may lead to higher perceived exertion during a task. Mental fatigue should be considered significant because it is probably influencing the results obtained by physical performance.

**Keywords:** Mental fatigue, Performance, Endurance, Psychobiological state

## The Effect of Selected Psychological Factors on the Performance of Top-Ranking Tennis Players in Sri Lanka

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Psychological factors such as self-confidence, motivation, emotion control, concentration and attention have been shown to play a crucial role in sports performance. Limited studies have been done on the effect of psychological factors on the performance of competitive tennis players in Sri Lanka. This study aimed to determine the effect of psychological factors such as self-confidence, motivation, emotion regulation, and concentration and attention on the performance of Sri Lankan competitive tennis players. The sample consisted of 20 top-ranking tennis players (age range: 16-34 years; male=7, female=13) selected through purposive sampling. Data were gathered using a pre-validated, self-administered, Likert scale questionnaire developed based on previous literature. The questionnaire comprised 71 questions focused on self-confidence (Q1-Q13), motivation (Q14-Q33), emotional control (Q34-Q43), concentration and attention (Q44-Q63), and performance of players (Q64-Q71). Pearson's correlation coefficient test was used to determine the significant relationships between the selected psychological factors and the performance of tennis players. Data were analyzed using SPSS version 25 at a 5% level of significance. Results revealed that there were moderate positive correlations between self-confidence and performance ( $p < 0.001$ ,  $r = 0.460$ ), and emotional regulation and performance ( $p = 0.002$ ,  $r = 0.652$ ) of tennis players. Further, strong positive correlations were observed between motivation and performance ( $p < 0.001$ ,  $r = 0.712$ ), and concentration/attention and performance ( $p < 0.001$ ,  $r = 0.862$ ) of tennis players who participated in this study. Results support the hypotheses that self-confidence, motivation, emotional regulation, concentration, and attention have a positive significant effect on the performance of Sri Lankan top-ranking senior tennis players. Accordingly, coaches can pay attention to psychological training focused on self-confidence, motivation, emotion regulation, concentration and attention to enhance the performance of competitive tennis players.

**Keywords:** Performance, Competitive tennis, Self-confidence, Motivation, Emotional control, Concentration

## **The Relationship Between Physical Activity Levels and Stress Among Baseball Players During the COVID-19 Pandemic**

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Participation in baseball is associated with numerous psychosocial health advantages, including resilience, increased mental health, a sense of belonging, higher levels of self-efficacy, less stress, enhanced coping, and positivity. The COVID-19 pandemic is a significant global health concern, impacting both baseball players and sportsmen from other sports. Psychological stress is a negative affective state. The association between physical activity and psychological stress was commonly reported in previous research even though it is stated that engaging in sports activities reduces the stress of individuals. Therefore, this study was conducted to investigate the relationship between physical activity levels and the perceived stress of Sri Lankan baseball players during the COVID-19 pandemic. It was decided to undertake a cross-sectional study involving 150 baseball players from colleges and universities. A questionnaire was developed based on the previous literature and the reliability was confirmed through a pilot test before using it in the original study. Data were analysed using SPSS version 25.0 and Pearson correlation and regression analysis were the techniques used to derive results. The influence of COVID-19 on the stress levels of players was measured using standard computation employing point scales, converted scores, and physical activity coefficient values. According to regression and correlation statistics, physical activity level and stress have a positive correlation and this research finding agrees with the previous studies. It has been demonstrated that COVID-19 consequences affect players' psychological well-being.

**Keywords:** Physical activity level, Stress, COVID-19, Psychological wellbeing

## **Mental Toughness and Success in Sports: A Study of Weightlifters in Northern Province**

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The influence that psychological factors have on athletic performance is becoming increasingly important today, and coaches, athletes, and sports administrators recognize that success cannot be guaranteed by raw physical talent alone. In the case of Sri Lanka, there are only a handful of studies that have focused on the weightlifting event and the factors influencing its performance. There is even less research being done on weightlifting events in the Northern Province. This study examined mental toughness that contributes to sports performance and its relationship to the performance of weightlifters in the Northern Province of Sri Lanka. The survey data required for the study was gathered from 150 male and female weightlifters residing in the Northern Province. The sample was selected based on the purposive sampling technique. The mental toughness questionnaire was utilized to develop the questionnaire and the reliability was confirmed through a pilot test before using it in the original study. Data were analysed using SPSS version 25.0. The results of the study confirmed that the facets of consistency and control of mental toughness are affecting weightlifters' achievements ( $p < 0.001$ ). The knowledge obtained from this study can contribute towards strengthening awareness of the importance of psychological constructs and their application at all levels of the game.

**Keywords:** Mental toughness, Weightlifting, Confidence, Control, Performance

## Exercise Behavior Among Sri Lankan Undergraduates

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The young generation is more engaged in exercise and physical activities than adults to maintain their body image and to be in line with the body mass index norms developed by the World Health Organization. Undergraduates tend to engage in sports and physical activities including aerobics, Zumba, yoga, and strength training to maintain their body image. The exercising behaviour of male and female undergraduates may not be the same. Therefore, the objective of this study was to identify the differences in exercise behaviour between male and female undergraduates. The purposive sampling techniques were used to select 469 undergraduates (male=209, female=260) from the University of Sri Jayewardenepura (age: 19-28 years) as the sample for the study. Data were gathered using the modified 14-item Exercise Behavior Questionnaire (EBQ). Data were analyzed using SPSS version 22.0. Data were not normally distributed; therefore, nonparametric tests were used to analyse data. Mann-Whitney U test revealed that the exercise behaviour between male and female undergraduates is significantly different for all five exercise behaviour variables studied. According to the results, the scores of male undergraduates were significantly higher than those of females for exercise behaviour variables such as managing weight ( $p=0.03$ ), improving body tone ( $p<0.001$ ), upgrading physical attractiveness ( $p<0.001$ ), and improving health ( $p<0.001$ ), whereas female undergraduates had higher ( $p=0.01$ ) scores for enhancing mood compared to their male counterparts. It can be concluded that male undergraduates are more concerned with their weight, body tone, health, and physical attractiveness while female undergraduates are more concerned about their mood enhancement. Coaches, trainers, and gymnasium instructors can design exercise/training programmes to match the exercise behaviour of young males and females.

**Keywords:** Body image, Exercise behaviour, Undergraduates

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**TRACK 2**

**SPORTS MARKETING, SPORTS TOURISM, SPORTS FACILITY DESIGN,  
SPORTS ORGANIZATIONAL BEHAVIOUR, SPORTS LEADERSHIP**

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## A Survey to Explore User Perception on Attributes of Urban Walking Trails

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Walking is one of the most common forms of physical activity with widely accepted health benefits. The Sri Lankan government is in favour of an active population and has built walking trails in aesthetic environments to encourage walking. The nature of trail attributes is crucial in determining the effectiveness of walking and therefore, their periodical assessment through the user's perception is necessary for optimum utilization. The present study was undertaken to determine the user perception of trail attributes of walking trails in urban settings. A questionnaire-based survey was conducted at the Independent Squire (ISQ) and Bellanwila (BEL) walking trails randomly recruiting 131 participants. Data were summarized using descriptive statistics adopting SPSS software. Findings revealed that most users across the trail location were middle-income and educated working-class people, aged between 19-64 with the highest representation from the 35-64 age group (40%) with female domination (59%). The lowest participation was recorded in children and adolescents (8%). All the age groups except children were either overweight or obese indicating the need for walking. Users thought that the width of the ISQ trail (3 m) was inadequate (71%). Further, users complained about the lengthiness of the BEL trail (66%). The users had a positive perception of the characteristics of the surface materials of both trails. In contrast, the users had a negative perception of factors such as surface dampness, suitability for the disabled, walkability with bare foot, surface evenness, presence of nuisance insects, noisy shoes, dog fouling, evidence of regular maintenance and willingness to pay for the facility. Similarly, the aesthetic characteristics of the surrounding environment and the status of maintenance in both trails were appreciated. At the same time, the inappropriate human activities and inadequacy of lighting were commented on negatively. The results indicate the need for regular maintenance of the trails although means of self-generating funds have not yet been established. In conclusion, the overall perception of trail attributes is appreciable but alternative strategic approaches are needed for regular maintenance to ensure sustainability.

**Keywords:** Walking, Walkability, Trail attributes, Perception



## **The Impact of Local Food Culture on Choosing Sri Lanka as a Destination for Marine and Coastal Sports Activities**

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Sport, as a reflexive or dynamic activity, has a significant role in our lives. It has become a social phenomenon and an economic phenomenon where the sports industry has now blended with the tourism industry creating a pathway to develop sports tourism. Sports tourism involves travelling and visiting a destination for sporting reasons, either active or passive. Hence, this qualitative study, using the keyword identification technique and photo-elicitation technique, investigated the impact of regional cuisine and international marine and coastal sports tourism when choosing Sri Lanka as a tourist destination. Direct interviews were administered, and the photo elicitation was carried out with the direct photos captured in destinations and with web-published photographs. The use of a grounded qualitative research approach made it possible to discover that the tourists adore Sri Lankan cuisine and coastal and marine sports. Additionally, all visitors have access to at least one marine and coastal sport in the southern province. The information gathered proved the study's primary goal. The development of food tourism in the country is still questionable.

**Keywords:** International marine and coastal sports tourism, Local food, Social media, Eating habits

## **Environmental Concerns and Consumers' Purchase Intentions of Buying Green Products: A Study Considering Green Buying Behaviour of Sports Science and Management Undergraduates of the University of Sri Jayewardenepura**

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During the past few decades, because of environmental hazards, green purchases have been subject to a wide array of studies. Scholars have noted that sports can be a considerable cause of damage to the environment due to the use of non-renewable resources, emission of hazardous substances during construction and sports facility operation, and production and disposal of sports-related equipment. The main objective of the study was to determine the environmental concern of Sports Science and Management undergraduates on green buying behaviour. The research participants were the Sports Science and Management undergraduate of the University of Sri Jayewardenepura ( $n=243$ ) who responded to a questionnaire designed to measure the related concepts. A census sampling technique was used and a total of 140 usable responses were obtained. The validity and reliability of the questionnaires were measured through correlation matrices and Cronbach's alpha, respectively. Regression analysis was used to analyze data. The results indicate that consumers' environmental concerns significantly affect their green buying behaviour. It was also revealed that consumers are willing to buy green products, but the intention is diluted due to the inability to afford the high prices. The outcomes of this study offer useful insights for developing effective strategies for consumers to generate more positive perceptions, expectations, and attitudes towards purchasing green products than their current consumption. This study may also suggest that manufacturers rethink potential ways of developing cost-effective green products and develop effective marketing strategies to satisfy the values of customers.

**Keywords:** Environmental concerns, Green buying behaviour, Consumer, Green products, Undergraduates

## **A Study of Cognitive State Anxiety Leading to Psychological Disorders of Sri Lankan Kabaddi Players Suffering from Injuries**

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Kabaddi is a contact sport with seven players on each side and is also considered an indigenous sport in India. It is the national sport of Bangladesh. Since Kabaddi is a combative sport, the players are said to suffer from a higher-order anxiety level during the game and high levels of injuries are reported among team players. The objective of the present study was to investigate whether the said injuries may lead to the development of cognitive state anxiety of Kabaddi players which in turn leads to psychological disorders of the players under consideration. The study sample consisted of 65 provincial-level male and female Kabaddi players and the sampling technique was the purposive sampling method. To achieve the objectives of the study, a quantitative research design under the deductive method was adopted. The study was carried out by distributing a structured validated questionnaire developed based on previous literature. Data analysis was conducted using SPSS version 23.0. The validity and reliability of the questionnaires were measured through correlation matrixes and Cronbach's alpha, respectively. Correlation and regression analysis were administered to analyze data. The results from the study confirm that cognitive state anxiety may lead to psychological disorders in Kabaddi players in Sri Lanka. It is recommended to expand this study to measure the overall level of anxiety of injured Kabaddi players to develop psychological programmes to mitigate psycho-physical disorders.

**Keywords:** Psychology effects, Cognitive state anxiety, Kabaddi

## **The Role of Sports in the Tourism Development of Sri Lanka**

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Tourism is considered the third largest source of foreign exchange in Sri Lanka. Tourist arrivals play a vital role in boosting the revenue generated through tourism. The key attractive sources to choose Sri Lanka over other South Asian countries include cultural heritage, hospitality, beautiful beaches and tropical climate. Other than the specific factors, most young tourists are attracted to water sports and foods in Sri Lanka. This research was conducted to understand the role of sports in the tourism development of Sri Lanka. A qualitative approach was used to empirically test the role of sports in tourism development. Semi-structured interviews were administered with 15 tourists (7 male respondents and 8 female respondents) who were involved in water sports in the southern province coastal area. Thematic analysis revealed that more tourist attractions are there in Sri Lanka for water sports such as water rafting, kite surfing, scuba diving, knee boarding, snorkelling, canoeing, kayaking, catamaran, water skiing, jet skiing, and windsurfing. It was furthermore revealed that the facilities available including equipment and skilled labour to handle such water sports need more improvements. It is suggested to focus more on publicizing such sports via different promotional tools among tourists to attract them to Sri Lanka as a sports tourism destination.

**Keywords:** Water sports, Sports tourism, Coastal areas, Promotional tools

## **Factors Affecting Green Buying Behaviour of National Athletes in Sri Lanka**

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Customers have progressively adopted sustainable lifestyles and sustainable consumption of products and services that do not destroy the environment and do not compromise the future. New classes of consumers as green consumers and products as green products have emerged. This study was conducted to assess the factors affecting the green buying behaviour of national athletes in Sri Lanka. Based on prior studies, five factors that may influence the buying behaviour of the national athletes in Sri Lanka were identified namely: social factors, cultural factors, personal factors, psychological factors, and economic factors. Using these factors, five main hypotheses were formulated for the study. A convenience sampling technique was used and 200 national athletes from Sri Lanka national team sports were selected for the study. The collected data set was analyzed using descriptive and inferential analysis techniques using SPSS version 26. Research findings have provided some insights into local businesses in Sri Lanka where most of the consumers are middle-income earners who are facing numerous challenges in promoting consumers for purchasing green products. Especially, they can focus more on the provision of economically friendly green products to consumers since the buying power of players is perceived to be less as per the findings.

**Keywords:** Green buying behaviour, Social factors, Cultural factors, Personal factors, Economic factors

## **Determinants of the Athletes' Perceived Performance in 1AB Schools in Kekirawa Zone in North Central Province in Sri Lanka**

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In the Sri Lankan context, sports performance at the school level is affected by unique factors including school involvement in coaching activities, family contribution, and knowledge of the importance of sports, sports participation, and sports facilities. The Kekirawa zone of North Central province is an area with fewer sports facilities compared to most other metropolitan areas. This study aimed to investigate the determinants of the athletes' perceived sports performance in 1AB schools in the Kekirawa zone of North Central province in Sri Lanka. Based on past studies, sports facilities and equipment, sports nutritional support, and the relationship with sports coaches were considered as the independent variables and athletes' perceived performance at the school level was considered the dependent variable. The sample consisted of 135 randomly selected students of 1AB schools in the Kekirawa Zone. Data was collected using a five-point Likert scale questionnaire prepared based on empirical studies and analysed using SPSS version 26. After data screening, demographic analysis, reliability analysis, normality tests and correlation testing were performed. Established hypotheses were tested using the Pearson correlation coefficient. All the hypotheses were supported by the results of these analyses. Accordingly, the study recommends formulating different strategies and programs including enhancing facility allocation for sports activities in terms of human resources, physical resources and financial resources, inter-organisational collaborations to obtain technical expertise and funding, initiating effective nutrition provision programmes, and enhancing the student-coach relationship with a goal-driven mindset to improve school-level athletes' sports performance.

**Keywords:** Athletes' perceived performance, Sports facilities and equipment, Sports nutritional support, Sports coaches' relationship

## Online Purchase Intention of Sri Lankan Consumers for Sports Goods and Apparels: An Approach of the Model of Goal-Directed Behaviour

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Rapid advancements in the internet and technology resulted in a significant delivery of E-commerce in Sri Lanka leading to a flourishing E-commerce industry. The theory of planned behaviour, the theory of reasoned action and the technology acceptance model have been used dominantly in Sri Lanka to predict customer intentions and behaviour. However, these theories do not regard customers' emotions. Utilization of the model of goal-directed behaviour (MGB) in the Sri Lankan e-market context not only takes the customer emotions into account but also closes the knowledge gap of the MGB. This study aimed to examine the relationship between purchasing desire (DES) and behavioural purchase intentions (PI) of Sri Lankan customers in purchasing sports goods and apparel online, utilizing the MGB. According to empirical studies, purchasing desire is determined by consumers' attitude (ATT), subjective norms (SN), perceived behavioural control (PBC), anticipated emotions (AE), and frequency of past behaviour (FPB), while introducing consumer-perceived value (CPV) as a new variable. Accordingly, specific objectives were set to examine the relationships between each of these determinants and the purchasing desire. Apart from the above, the direct relationships between PBC and PI and, FPB and PI were also examined. Data were collected through an online questionnaire utilizing a five-point Likert scale, from a sample of 300 consumers (age: 20-29 years) who have purchased sports goods online within the last twelve months and analyzed using SPSS version 20.0. Results showed strong positive relationships between ATT and DES, SN and DES, and AE and DES. The most significant relationship was between CPV and DES ( $p < 0.001$ ,  $r = 0.702$ ), stronger than the traditional variables of the MGB. Moderate positive relationships were revealed between PBC and DES, and PBC and PI. DES was found to have a very strong positive relationship with PI ( $p < 0.001$ ,  $r = 0.899$ ). The above findings would be beneficial for online sports goods vendors as the desire for online sports goods purchasing can be easily increased by affecting the consumer's emotions, desires, and perceived values.

**Keywords:** Sporting goods, Model of goal-directed behaviour, Purchase intention, Desire, Sri Lanka sporting goods and apparel

## **The Impact of User-Generated Content of Facebook on the Behavioural Intention of Domestic Sports Tourists with an Emphasis on Sports Tourist Destinations in Sri Lanka**

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Sports tourism has become an emerging area across the globe. Recent developments in social media-based marketing strategies have dynamically accelerated the development of the sports tourism industry. This study aims to investigate how user-generated content (UGC) on Facebook can become a tool for domestic sports tourists in Sri Lanka. The research focuses on an extended technology acceptance model (TAM) which integrates the constructs of ease of use, perceived usefulness, e-word-of-mouth (EWOM), perceived reliability and enjoyment. This study is conducted as a deductive quantitative study that followed a descriptive research approach. Data were collected via an online questionnaire. The main findings are related to the key role of the dimensions of UGC on Facebook on domestic travellers' behavioural intentions which is operationalized with the choice of sports tourist destinations. Furthermore, these dimensions were identified as EWOM, ease of use, enjoyment, perceived reliability, and perceived usefulness which represent a stronger predictor for domestic travellers' behavioural intention. Data cleaning, reliability tests, normality tests, validity tests, correlation analysis and regression analysis were carried out to reach study objectives using SPSS version 22.0. All independent variables showed positive correlations with the behavioural intention of the sports travellers. Accordingly, it was revealed that to influence domestic sports travellers' behavioural intention, destinations need to pay attention to EWOM, perceived reliability, perceived usefulness, ease of use and enjoyment of the UGC on Facebook. This helps firms to obtain authentic information from their guests in an interesting way. The findings of this research support the development of the sports tourism industry based on marketing and communication strategies focused on online contexts.

**Keywords:** Domestic sports tourists, Sports tourism destinations, Facebook, User-generated content



## **The Relationship Between Coaches' Leadership Styles and Team Cohesion Among Sri Lankan Male Basketball Players**

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Team cohesion is a critical determinant of the success of team sports and several leadership theories and models have suggested that team cohesion is influenced by the coaches' leadership style to a greater extent. The primary objective of the current study was to investigate the impact of various leadership styles, such as democratic coaching style, autocratic coaching style, social support, positive feedback, and training and instruction, on team cohesion of male basketball players in Sri Lanka. The aim was to identify the most effective coaching style that can lead to higher team cohesion. A quantitative research design under the deductive method was adopted to achieve the research objectives. The study was carried out by distributing a structured online questionnaire developed based on previous literature, among the male basketball players who took part in the 53<sup>rd</sup> Senior National Basketball Championship in 2021, Sri Lanka. Seventy complete responses were used for data analysis. Data screening for missing values, demographic analysis, reliability analysis, normality test and correlation tests were performed using SPSS version 22.0. The findings suggest that coaches who exhibit a higher degree of democratic leadership, social support, positive feedback, and sufficient training and instruction have a positive impact on team cohesion among male basketball players in Sri Lanka. Conversely, the study found that autocratic behaviour has no significant effect on team cohesion. Therefore, coaches are recommended to continuously consult and mentor their athletes, conduct debriefing sessions, and engage in ongoing performance evaluations to improve effective team management.

**Keywords:** Leadership styles, Team cohesion, Basketball teams

## **The Relationships Between Psychological and Sociological Factors and Sports Performance of the Athletes at the University of Sri Jayewardenepura**

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Recently, factors such as pandemic situations, political and social unrest, and economic crises have also created dynamic behavioural changes among the sports community, creating psychological and sociological behavioural changes, affecting the performance of athletes. This study aimed to examine the relationships between psychological and sociological factors and the sports performance of the athletes of the University of Sri Jayewardenepura. The study adopts psychological factors (pre-competition anxiety and trait anxiety) and sociological factors as independent variables and athletes' sports performance as the dependent variable which were measured using four pre-validated questionnaires namely, sports competition anxiety test questionnaire (SCAT), competition state anxiety test inventory-2 (CSAT-2), attitude towards sports participation questionnaire (social attitude scale) and performance level questionnaire. The questionnaires were distributed through online platforms among 186 male and female athletes from the University of Sri Jayewardenepura who participated in inter-university sports events. The sample was selected through universal sampling which resulted in a response rate of 92.5% ( $n=172$ ). Demographic analysis, data screening, reliability analysis, normality tests, and correlation tests were performed using SPSS version 22.0. An equal proportion (50%) was represented by both sexes in the study sample. Results revealed that there are negative correlations between each of the independent variables and the dependent variable of the study. Accordingly, the study recommends that university administrators pay more attention towards initiating continuous programmes such as counselling, mentoring, out-bound training programmes, periodical evaluations of athlete careers, and providing feedback to uphold athletes' psychological level and improve traits such as courage, sportsmanship, and leadership to achieve and maintain excellence in sports performance.

**Keywords:** Psychological factors, Pre-competition anxiety, Trait anxiety, Sociological factors, Athlete performance

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**TRACK 3**  
**TRAINING METHODS, SPORTS BIOMECHANICS, GENERAL THEORY OF**  
**SPORTS TRAINING**

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## **The Effect of Callisthenics Strength Training on Arm Power, Leg Power, and Core Strength of School-Level Football Players**

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Callisthenics is a group of exercises that use an athlete's body weight. These exercises involve movements of large muscle groups with moderate velocity to enhance coordination, flexibility, power, and strength. The objective of this study was to examine the effect of callisthenics strength training on leg and arm power, and core strength of adolescent football players. Twenty-five male football players (age: 13.0±2.2 years; weight: 60.0±7.3 kg; height: 170.3±5.2 cm) were divided into two groups: the callisthenics strength training group (CT) ( $n=13$ ) and the control group (CG) ( $n=12$ ). CT performed exercises such as half and deep squats, crunches, close and wide pike grip push-ups, walking lunges, plank, glute bridge, straight leg raises, lateral lunges, lying knee tucks, calf raises, jumping squats, incline and decline push-ups, plank, dynamic push-up, single leg squat, knee to jump, and jumping lunges for eight weeks, three sessions per week. CG underwent their normal training programme during this period. The leg power, arm power and core strength of participants of both groups were tested at baseline and post-training using the vertical jump test, medicine ball throw test, and one-minute sit-up test, respectively. The statistical analysis was conducted using SPSS and a paired sample t-test was used to compare the pre-post values of each test conducted in the two groups. Results showed that the callisthenic strength training programme significantly increased the leg power, arm power, and core strength of CT compared to baseline values ( $p<0.05$ ). However, there was no significant improvement in the above variables in CG ( $p>0.05$ ). Results indicate that the eight-week callisthenics strength training programme used in this study could be an effective training method to improve leg and arm power and core strength of school-level football players without the use of training equipment.

**Keywords:** Callisthenic training, Leg power, Arm power, and Core strength

## **A Biomechanical Analysis of Direct Free Kicks in Sri Lankan Football Players**

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Direct free kicks play a vital part in football games. In the majority of cases, a direct free kick has the power to alter the momentum of a game with a score. The two main factors that determine whether a soccer direct free kick is successful are kicking accuracy and ball speed. This study aimed to investigate the effects of biomechanical angles and target positions on ball speed and kicking accuracy of strong soccer instep kicks. The specific objectives were to investigate the correlations between the angles and ball speed as well as how biomechanical angles of the foot, thigh, and shank relate to a successful direct free kick and the ball speed. Thirty skilled soccer players participating in the National Division A tournaments kicked a total of 27 forceful instep kicks at nine different places from 20 m, 25 m, and 30 m away as left, right, and middle. The ball used was a regular size 5 football. Two high-speed cameras recorded the kicking angles and ball speed during the contact phase. The study results revealed significant correlations between the ball speed and biomechanical angles of kicking leg foot angle ( $p < 0.05$ ,  $r = 0.72$ ), thigh angle ( $p < 0.05$ ,  $r = 0.62$ ), shank angle ( $p < 0.05$ ,  $r = 0.54$ ), and supporting leg thigh angle ( $p < 0.05$ ,  $r = 0.46$ ) related to the consecutive positions of 20 m, 25 m, and 30 m to the left, middle and right positions. Although these correlations were found in the analysis, most Sri Lankan players perform with their natural skills rather than biomechanical knowledge. Therefore, understanding biomechanical angles during direct free kicks will be a good coaching attempt for the Sri Lankan coaches in their coaching to improve the techniques of Sri Lankan football players.

**Keywords:** Biomechanical angles, Ball speed, Direct free kick, Kicking accuracy

## **A Biomechanical Analysis of the Grab and Track Swimming Starts of School-Level Swimmers in Sri Lanka**

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Elite-level swimming competitions are won by a fraction of a second, and every improvement in minimizing the timing can be a considerable advantage for swimmers to win competitions. Therefore, swimmers focus on every phase of competitive swimming and numerous research has been conducted to determine the factors that could improve swimming phases. Among them, the starting phase of swimming plays a vital role. The swimming start is typically broken into three sub-phases: on-block, flight, and underwater phases. This study aimed to compare the grab and track competitive swimming start techniques with a particular focus on the relationship between angles of lower limbs and time. The on-block and flight phases were mainly targeted by this research. Thirty male school-level swimmers were used as the sample, and swimmers performed both grab and track techniques. Data were collected using a 30 Hz camera placed above the water level. The video data were digitized, and the analysis was performed using the Silicon Coach Live motion analysis system. Global angles that were studied were thigh angle and shank angle. There were no significant correlations between global angles and time consumed in each phase except in one comparison. A significant positive moderate correlation was observed between the shank angle of the on-block phase of grab start and reaction time ( $p < 0.05$ ,  $r = 0.64$ ). The results of this research study will help coaches optimize foot placement during the on-block phase when performing the grab start.

**Keywords:** Grab start, Track start, Swimming, Lower limb angles, On-block phase

## **The Effect of a 12-Week Fitness Training Programme on Physical Fitness of National-Level Kabaddi Players in Sri Lanka**

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Physical fitness is an essential aspect governing the performance of an athlete, which can be developed through a systematic training programme. This study aimed to identify the effect of a 12-week training programme on the physical fitness of national-level Kabaddi players in Sri Lanka. This study used an experimental pre-test and post-test study design. The study sample consisted of 18 male national-level Kabaddi players whose chronological ages were between 18 to 34 years. The participants were randomly divided into the experimental group ( $n=9$ ) and the control group ( $n=9$ ). The intervention applied in the study was a specific 12-week training programme. The control group underwent regular training sessions during the experimental period. Variables such as maximal oxygen consumption ( $VO_2$  max), body mass index (BMI), body fat level, vertical jump distance, and the 20 m sprint test time were measured in both groups at baseline and following the experimental period. Pre-post data of each variable were compared using the paired sample t-test. The result revealed that there was a significant difference between heart rate ( $p=0.05$ ) and  $VO_2$  max ( $p<0.01$ ) between the pre and post-test in the experimental group. However, there were no significant differences between the pre and post-values of the experimental group for variables such as the BMI ( $p=0.62$ ), body fat level ( $p=0.80$ ), vertical jump distance ( $p=0.37$ ), 20 m sprint test time ( $p=0.25$ ), and agility test time ( $p=0.94$ ). The present study observed that the specific 12-week training programme applied to the national-level Kabaddi players partially affected their physical fitness as indicated by an improvement in heart rate and  $VO_2$  max. However, similar experiments on new training methods with larger sample sizes under controlled conditions are required to determine the effects of the innovative training methods that could help coaches obtain the best performance of Kabaddi athletes during competitions.

**Keywords:** Chronic effects, Endurance, Physical fitness, Kabaddi

## **Body Image Perception and Supplement Usage Among Weightlifters, Bodybuilders, and Powerlifters in Sri Lanka**

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Throughout the evolution of humankind, the beauty of the body has become a central role in people's day-to-day lives. It has been identified that most people are widely using a range of supplements to enhance sports performance, especially in body-weight-based sports such as weightlifting, powerlifting, and bodybuilding. However, the association between body image perception and supplement usage in Sri Lankan weightlifters, bodybuilders, and powerlifters is unknown. This study aimed to identify the relationship between body image perceptions and supplement usage among male weightlifters, powerlifters and bodybuilders in Sri Lanka. Fifty-one national and provincial level players in bodybuilding ( $n=31$ ), powerlifting ( $n=10$ ) and weightlifting ( $n=10$ ) whose chronological age was  $26.6\pm 2.7$  years participated in the study. Participants completed a self-reported online questionnaire developed based on previous studies, which measured body image perception and supplement usage. Data were analyzed using SPSS version 26. Pearson correlation test results revealed that there was no correlation ( $p>0.05$ ) between body image perception and supplement usage of weightlifters and powerlifters who participated in this study. However, in bodybuilders, a positive moderate correlation existed between body image perception and supplement usage ( $p=0.008$ ,  $r=0.48$ ). Further, results showed that there was no significant relationship between body image perception and the body mass index of participants ( $p>0.05$ ). In conclusion, body image perception is moderately correlated with supplement usage in bodybuilders, but not in weightlifters and powerlifters. Supplement usage and its relationship with body image perception is a timely needed area to study from different perspectives. By understanding the nature and reasons for supplement usage, coaches can provide individualized training plans, develop strategies, and help athletes cope with various challenges.

**Keywords:** Bodybuilding, Body image perception, Powerlifting, Supplements usage, Weightlifting



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**TRACK 4**  
**EXERCISE PHYSIOLOGY, SPORTS INJURIES, SPORTS NUTRITION,**  
**DOPING IN SPORTS**

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## **The Knowledge and Attitudes of the Tri Forces Wrestlers on Dietary Supplements in Sri Lanka**

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Wrestling is the oldest sport which was also included in the Olympic Games. Recently wrestling became a world-famous sport. In Sri Lanka, a significant number of wrestlers are represented by the tri forces where intense competition is observed among the tri forces and the attention towards the athletes representing tri forces performance level has increased vastly. Wrestlers use various types of dietary supplements to improve their performance, with or without clear knowledge and a positive attitude toward dietary supplements. This study is mainly focused on the assessment of the extent of knowledge and attitudes of Sri Lankan three forces wrestlers on the use of dietary supplements. The main objective was to determine the impact of knowledge and attitudes on the level of supplement consumption by wrestlers in tri forces in Sri Lanka. A Likert scale questionnaire developed based on past studies was adopted. Dietary supplement usage was considered the dependent variable while dietary supplement knowledge and attitudes were considered the independent variables. Data were collected from 107 male and female wrestlers. The statistical analysis was performed using SPSS version 22.0. A descriptive analysis of the study sample was carried out. Since the data were not normally distributed, a non-parametric test was performed for the correlational analysis. The relationships between knowledge and supplement usage ( $p=0.042$ ,  $r=-0.197$ ) and the relationship between attitudes and supplement usage ( $p=0.048$ ,  $r=-0.191$ ) showed negative correlations. Accordingly, the results propose that educational and training programmes can enhance awareness about dietary supplementary intakes and will facilitate wrestlers for the optimum consumption of dietary supplements for performance enhancement.

**Keywords:** Wrestling, Tri forces wrestlers, Dietary supplement knowledge, Dietary supplement usage, Attitudes toward dietary supplements

## **The Effect of Core Strength and Stability on Upper Body Power Output: A Narrative Review**

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Upper body power production plays a significant role in sports performance. The core muscles include the abdominal, back, and pelvic muscles. Core strength may play an important role when transferring the force produced from the lower body to the upper body with minimum energy dissipation. Moreover, most upper body actions require the stability of the core muscle groups to maintain control of the movements. This narrative review provides an overview of current knowledge on the effect of core strength and stability on upper body power production. A database search was conducted using the PubMed electronic database on 19<sup>th</sup> February 2023 using the following keywords [Title/Abstract]: (((Core strength) OR (Trunk strength) OR (Core stability) OR (Trunk stability)) AND ((Upper body power) OR (Upper body power output) OR (upper body explosive power))). From the initial database search and other sources (after screening the references), 33 records were identified. Eight studies were included in this narrative review after evaluating the abstracts. Five studies showed that improving core strength has positively affected the upper body power output, which may support improving sports performance. Furthermore, there was a positive correlation between core stability and upper body power output. However, three studies showed no significant correlation between core strength and stability with upper body power output. In conclusion, core strength and stability positively affect the upper body power output and the control of the upper body movements, which may help athletes improve their performance and reduce injuries. However, it is crucial to further investigate the effect of core strength and stability on upper body power production and movement control.

**Keywords:** Core strength, Core stability, Upper body power

## The Effect of Dietary Habits on Menstrual Cycle Irregularities of Female Athletes at the University of Sri Jayewardenepura

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University athletes follow unhealthy food habits due to the unavailability of healthy foods on campus and inadequate nutrition knowledge. Unhealthy food habits could result in inadequate nutrient intake that may lead to menstrual irregularities. This study aimed to discover the relationship between the dietary habits and menstrual cycle irregularities of female athletes who represented the University of Sri Jayewardenepura at the Interuniversity Games 2019. The sample consisted of 136 athletes (age range: 23–27 years) representing sports such as hockey ( $n=16$ ), karate ( $n=11$ ), badminton ( $n=7$ ), basketball ( $n=12$ ), volleyball ( $n=11$ ), table tennis ( $n=7$ ), swimming ( $n=7$ ), taekwondo ( $n=17$ ), netball ( $n=12$ ), Elle ( $n=15$ ), athletics ( $n=15$ ) and weightlifting ( $n=6$ ). Informed consent was obtained from participants before collecting data. Data were collected using the Menstrual History Questionnaire and a pre-validated, standard questionnaire about food habits. The chi-square test was used to determine the associations between dietary habits and menstrual cycle irregularities of participants at a 5% level of significance. Data were analysed using SPSS software (version 25.0). According to the results, the percentage of menstrual cycle irregularities among respondents was 7%. Most participants showed healthy food habits such as drinking 4-6 L of water per day (55%) and consuming adequate amounts of fruits (65%), vegetables (72%), and dairy products (56%) at least four days per week. A significant association was observed between menstrual cycle irregularities and the frequency of consuming breakfast ( $p=0.031$ ,  $\chi^2=13.91$ ), carbonated beverages ( $p=0.019$ ,  $\chi^2=15.12$ ), fruits ( $p=0.003$ ,  $\chi^2=13.91$ ), and fast foods ( $p=0.009$ ,  $\chi^2=17.13$ ). Menstrual irregularities were common among athletes who skipped breakfast, frequently consumed carbonated beverages and fast foods, and rarely consumed fruits. It can be concluded that unhealthy dietary habits such as skipping meals, frequent consumption of carbonated beverages and fast foods, and inadequate consumption of fruits have a considerable effect on the prevalence of menstrual irregularities among the university athletes who participated in this study.

**Keywords:** Menstrual cycle irregularities, Food habits, University athletes

## **The Effect of Body Fat Percentage and Core Strength on Agility of Sri Lankan National-Level Squash Players**

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Agility is an important physical fitness component for squash players as the game involves explosive agility movements. Core strength is also important in squash because it involves intensive turning, lunging, and recovering movements that use core muscles. Lower body fat percentages have been linked to enhancing performance in many sports. Several studies have suggested a relationship between body fat percentage, core strength, and agility. However, no studies have been done on the effect of body fat percentage and core strength on the agility of squash players in Sri Lanka. This study aimed to determine the relationships between body fat percentage, core strength and agility of Sri Lankan National squash players. Twenty squash players having at least five years of national-level competition experience were selected for the study using purposive sampling. The body fat percentage of participants was measured using bioimpedance analysis. Five-meter star run was used to determine the agility of athletes and one-minute sit-ups test and medicine ball throw were used to determine the core strength of the participants. Data were gathered in triplicate at the beginning of the practice sessions following the standard warm-up. Pearson's correlation test was used to determine the significant relationships between the variables at a 5% level of significance. There was a strong positive correlation between body fat percentage and agility test timing of participants ( $p < 0.05$ ,  $r = 0.815$ ). Further, there was a strong negative correlation between the medicine ball throw and agility test timing ( $p < 0.05$ ,  $r = -0.790$ ) and a moderate negative correlation between the sit-up test and agility test timing ( $p < 0.05$ ,  $r = -0.484$ ). Results suggested that players with a lower body fat percentage and greater core strength show better agility performance. Accordingly, maintaining a lower body fat percentage and developing core strength could improve squash players' agility movements which can help to develop their sport-specific skills.

**Keywords:** Squash players, Body fat percentage, Agility, Core strength

## **The Effect of Physical Activity Level and Eating Habits on the Prevalence of Overweight and Obesity Among the Workers of Britannia Garment Packaging, Sri Lanka**

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Being overweight and obese is gradually becoming the number one health problem worldwide, which is mostly associated with an unhealthy lifestyle. This problem can be overcome through regular physical activity. This study aimed to identify the effect of physical activity level and eating habits on the prevalence of overweight and obesity among female and male workers of Britannia Garment Packaging in Sri Lanka. Data were collected from 62 male and female volunteer factory workers using questionnaires. Physical activity level was analysed using the International Physical Activity Questionnaire (IPAQ), the body mass index (BMI) was calculated by an appropriate formula, and chi-square statistic was used to examine the associations between categorical variables. Based on BMI norms developed by the World Health Organization, it was revealed that there were 31 overweight workers and 31 obese workers in the Britannia Garment Packaging. Furthermore, the statistical analysis revealed that there was no significant effect of physical activity level on the prevalence of overweight ( $p>0.05$ ) or obesity ( $p=0.06$ ) among female and male workers. Therefore, it can be concluded that the level of physical activity has not highly affected the prevalence of overweight and obesity among Britannia Garment Packaging workers. When considering eating habits, both the overweight group ( $p<0.001$ ) and the obese group ( $p=0.02$ ) showed a significant effect. Therefore, we can see a significant influence of eating habits on the prevalence of overweight and obesity among female and male workers. Finally, as eating habits influence the prevalence of overweight and obesity, special attention should be paid to healthy eating habits.

**Keywords:** Physical activity, Eating habits, Apparel sector workers, Body mass index Overweight, Obesity

## **The Influence of COVID-19 Lockdown Restrictions on Discerned Dietary and Training Habits of Sri Lankan National-Level Racquet Sports Athletes**

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The COVID-19 pandemic has led to substantial disruptions in sports activities worldwide, affecting the training and dietary patterns of athletes at every level. This study aimed to examine the impact of lockdown restrictions on the daily dietary and training habits of Sri Lankan national-level racquet sports athletes. Accordingly, a cross-sectional study was conducted during (20.08.2021 to 20.09.2021) and after (11.10.2021 to 21.11.2021) the second lockdown period. Two online questionnaires were distributed among the national-level badminton, tennis, table tennis, and squash athletes to obtain information on their demographic details, dietary habits, and training patterns. The responses of 79 participants who completed both questionnaires were analysed using the chi-square test. Results indicated no significant relationships ( $p > 0.05$ ) between the phases of lockdown and dietary habits, such as breakfast consumption frequency, number of meals per day, snacking frequency, and the total amount of food consumed. However, significant relationships were found between the lockdown and post-lockdown phases and the daily water consumption ( $p = 0.021$ ,  $\chi^2 = 7.34$ ), motivation to actively engage in training ( $p < 0.001$ ,  $\chi^2 = 38.14$ ), frequency ( $p = 0.013$ ,  $\chi^2 = 19.27$ ) and duration ( $p = 0.003$ ,  $\chi^2 = 19.71$ ) of cardio training, and duration of resistance training ( $p = 0.016$ ,  $\chi^2 = 15.60$ ). Results indicate that even though most athletes' dietary patterns were unaffected by the lockdown, daily water consumption notably increased after the lockdown restrictions were lifted. At the same time, considerable alterations in their training schedules were observed during and after the lockdown especially in motivation to train, frequency and duration of cardio training and duration of resistance training. The outcome of the study implies that with the cessation of lockdown restrictions, athletes were more inspired to train for longer hours, and they were keen to work out with increased intensity and frequency. Moreover, water intake became more significant after the lockdown, presumably due to the athletes' increased workload.

**Keywords:** COVID-19 lockdown restrictions, Dietary habits, Racquet sports athletes, Training habits

## **The Effect of Nutrient Intake During the Anabolic Phase on Delayed Onset Muscle Soreness of National-Level Wheelchair Athletes**

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Consumption of sufficient carbohydrates, protein, and water during the anabolic phase has been shown to promote rapid recovery from delayed onset muscle soreness (DOMS) among athletes. Only a few studies have been carried out on the nutrition needs of Paralympic athletes. This study aimed to determine the effect of macronutrient intake during the anabolic phase on DOMS of national-level wheelchair athletes. The sample consisted of 52 wheelchair athletes (male=39, female=13; age: 32.4±5.9 years; body mass index: 21.65±3.26 kg m<sup>-2</sup>) representing sports such as archery (*n*=6), rowing (*n*=10), tennis (*n*=11) and athletics (*n*=25). The dietary intake of the participants during the anabolic phase was recorded and the macronutrient and water intake were determined using Nutrisurvey 2007 software. McGill's pain questionnaire was used to measure the DOMS pain scores of participants 24, 48, and 72 hours after regular training. Spearman's Rho product-moment correlation test was used to determine the relationship between macronutrient and water intake during the anabolic phase and DOMS pain indices of participants at a 5% level of significance. The average energy intake of the participants during the anabolic phase was 398.1 kcal. The average carbohydrate, protein and fat intakes during the anabolic phase were 64.8 g, 12.9 g, and 9.7 g, respectively. However, no significant relationships were observed between carbohydrate, protein, fat, and water intake and pain indices of participants 24, 48, and 72 after training (*p*>0.05). Results suggest that macronutrient and water intake during the anabolic phase did not have an impact on the DOMS of wheelchair athletes who participated in this study. This study focused only on the macronutrients and water intake of wheelchair athletes. Future studies should be carried out to investigate the effect of micronutrient intake on DOMS while controlling variables such as physical activity level and competition status.

**Keywords:** Delayed onset muscle soreness, anabolic phase, wheelchair athletes



## **An Analysis of the Body Composition and the Bowling Speed of Sri Lankan Fast Bowlers**

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The speed of the ball at release is a major factor governing the success of fast bowling as it reduces the time available for a batsman to perceive and use information about the delivery and execute an appropriate motor response. Body composition analysis is a common practice in professional sports and could be a good determinant of ball release speed. This research aimed to determine the relationship between the body composition and the bowling speed of Sri Lankan fast bowlers. Thirty-four Sri Lankan male fast bowlers (age: 20–39 years, body mass index:  $23.91 \pm 2.79 \text{ kg m}^{-2}$ ) from the Colombo district were selected as the sample using purposive sampling. The body composition measurements were taken using the bioimpedance analyzer. The bowling speed of the participants was determined using a velocity radar gun. After an adequate warm-up, each bowler bowled an over (six trials) in an artificial cricket net and the highest recorded speed of each player was considered as the bowling speed for analysis. The Pearson correlation test was used to determine the relationship between the body composition measurements and the bowling speed. Data analysis was conducted using R programming language at a 5% level of significance. The bowling speed of the participants had an approximately symmetric distribution ( $129.99 \pm 5.36 \text{ km h}^{-1}$ ). Pearson correlation test revealed that the average bowling speed is negatively and weakly correlated with total fat ( $r = -0.2$ ,  $p < 0.05$ ) and visceral fat ( $r = -0.2$ ,  $p < 0.05$ ). Similarly, the average bowling speed had a weak, positive correlation with arm subcutaneous fat percentage ( $r = 0.3$ ,  $p < 0.05$ ), whole-body skeletal muscle mass percentage ( $r = 0.1$ ,  $p < 0.05$ ), trunk skeletal mass percentage ( $r = 0.4$ ,  $p < 0.05$ ) and leg skeletal mass percentage ( $r = 0.1$ ,  $p < 0.05$ ). No significant correlations were observed between bowling speed and other segmental body composition measurements. Accordingly, the results did not indicate any strong relationships between the body composition measurements and the bowling speed of the participants. More extensive studies should be carried out with larger samples to establish the relationship between the body composition variables and the bowling speed of fast bowlers.

**Keywords:** Cricket, Fast bowlers, Bowling speed, Body composition

## **Perceived Performance and Knowledge Regarding the Menstrual Cycle of Female Athletes at the University of Sri Jayewardenepura**

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No significant study has been conducted on the effects of the menstrual cycle on sports performance in the Sri Lankan context. This cross-sectional study aimed to determine the effects of the menstrual cycle on perceived sports performance among female athletes at the University of Sri Jayewardenepura. Coaches' knowledge about the menstrual cycle according to athletes' perceptions was also investigated. Data were gathered from 171 female athletes at the University of Sri Jayewardenepura. According to findings, 132 (81.5%) participants experienced a regular menstrual cycle while 4 (2.5%) had secondary amenorrhea. Regarding the effect of the menstrual cycle on sports performance, 150 (92.6%) reported a positive effect for physical strength/power, 147 (90.7%) for condition/endurance variation and 146 (90.1%) for mental sharpness/precision/balance/control in the first week after menstruation. The worst performance connection was associated with the period of bleeding, with 156 (96.3%) reporting a loss of physical strength/power, 148 (91.4%) loss of condition/endurance variation, and 148 (91.4%) reporting a reduction in mental sharpness/precision/balance/control. Most participants ( $n=295$ , 82.1%) have a male head coach but unfortunately, 126 (77.6%) coaches have a very low level of understanding of the subject, and 132 (81.5%) athletes reported they did not have the opportunity to communicate about the subject with their coach. Results revealed physical, psychological, and cognitive negative effects associated with the menstrual cycle in athletes who participated in this study, with many athletes reporting more negative impact with bleeding and a greater negative impact the week after menstruation. The perceived level of understanding among coaches and athletes was very low, and athletes had little opportunity to talk to coaches about menstruation issues. In conclusion, the menstrual cycle has an adverse influence on female athletes, who also detect certain performance changes throughout the phases of the cycle. It is necessary to increase awareness in this area among athletes as well as coaches.

**Keywords:** Menstrual cycle, Female athletes, Perceived performance



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