

2012

# Kinesiology & Exercise Sciences Abstracts

Eighth Annual International  
Conference on Kinesiology and  
Exercise Sciences, 25-28 June  
2012, Athens, Greece

Edited by Gregory T. Papanikos

THE ATHENS INSTITUTE FOR EDUCATION AND RESEARCH





Kinesiology & Exercise  
Sciences Abstracts

8<sup>th</sup> Annual International  
Conference on Kinesiology  
and Exercise Sciences, 25-28  
June 2012, Athens, Greece

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## Preface

This abstract book includes all the abstracts of the papers presented at the *8<sup>th</sup> Annual International Conference on Kinesiology and Exercise Sciences, 25-28 June 2012*, organized by the Athens Institute for Education and Research. In total there were 26 papers and 30 presenters, coming from 12 different countries (Albania, Canada, Czech Republic, Germany, Italy, Japan, Malaysia, Netherlands, New Zealand, Singapore, Saudi Arabia, South Africa, UAE, UK and USA). The conference was organized into 7 sessions that included areas Sport Neuro-mechanics, Training and Performance, Physical Activity and Health across the Lifespan, Health and Sports Psychology and other related fields. As it is the publication policy of the Institute, the papers presented in this conference will be considered for publication in one of the books of ATINER.

The Institute was established in 1995 as an independent academic organization with the mission to become a forum where academics and researchers from all over the world could meet in Athens and exchange ideas on their research and consider the future developments of their fields of study. Our mission is to make ATHENS a place where academics and researchers from all over the world meet to discuss the developments of their discipline and present their work. To serve this purpose, conferences are organized along the lines of well established and well defined scientific disciplines. In addition, interdisciplinary conferences are also organized because they serve the mission statement of the Institute. Since 1995, ATINER has organized more than 150 international conferences and has published over 100 books. Academically, the Institute is organized into four research divisions and nineteen research units. Each research unit organizes at least one annual conference and undertakes various small and large research projects.

I would like to thank all the participants, the members of the organizing and academic committee and most importantly the administration staff of ATINER for putting this conference together.

**Gregory T. Papanikos**  
**President**





**FINAL CONFERENCE PROGRAM**  
**8<sup>th</sup> Annual International Conference on Kinesiology and Exercise**  
**Sciences, 25-28 June 2012, Athens, Greece**

**PROGRAM**

**Conference Venue:** [Metropolitan Hotel of Athens](#), 385 Syngrou Ave., 175 64,  
Athens, Greece

**Organization and Scientific Committee**

1. Dr. Gregory T. Papanikos, President, ATINER.
2. Mr. Vagelis Kritikos, President, PASEM.
3. Dr. George Poulos, Vice-President of Research, ATINER & Emeritus Professor, University of South Africa, South Africa.
4. Dr. Nicholas Pappas, Vice-President of Academics, ATINER & Professor, Sam Houston University, USA.
5. Dr. Chris Sakellariou, Vice-President of Finance, ATINER & Associate Professor, Nanyang Technological University, Singapore.
6. Dr. Panagiota (Nota) Klentrou, Professor and Associate Dean Research and Graduate Studies, Faculty of Applied Health Sciences, Brock University.
7. Mr. Christos Anagnostopoulos, Head, Research Unit of Sports, ATINER & Lecturer, Coventry University, U.K.
8. Dr. Margarita Kefalaki, Director of Communication, ATINER.
9. Ms. Lila Skountridaki, Researcher, ATINER & Ph.D. Student, University of Strathclyde, U.K.
10. Mr. Vasilis Charalampopoulos, Researcher, ATINER & Ph.D. Student, University of Strathclyde, U.K.
11. Mr. Apostolos Kotsaspyrou, Researcher, ATINER.

**Administration:** Fani Balaska, Stavroula Kiritsi, Eirini Lentzou, Konstantinos Manolidis, Katerina Maraki & Celia Sakka

**C O N F E R E N C E P R O G R A M**

**(The time for each session includes at least 10 minutes coffee break)**

**Monday 25 June 2012**

**08:30-09:00 Registration**

**09:00-09:30 Welcome and Opening Remarks**

- Dr. Gregory T. Papanikos, President, ATINER.
- Mr. Vagelis Kritikos, President, PASEM.

**09:30-11:00 Session I: Sport Neuro-mechanics**

**Chair:** Pappas, N., Vice-President of Academics, ATINER & Professor, Sam Houston University, USA.

1. Lephart, A., Assistant Professor, Fort Lewis College, USA. The Position of the Centre of Mass during the Support Phase of Forward Somersaulting Skills on the Trampoline.
2. Minshull, C., Senior Lecturer, Nottingham Trent University, UK. Effects of Passive Versus PNF Stretch Conditioning on Neuromuscular Activation and Sensorimotor Performance.
3. Klaver-Krol, E., Clinical Neurophysiologist, Hospital Group Twente, The Netherlands, Henriquez, N.R., Clinical Neurophysiologist University Medical Centre, The Netherlands, Kuipers, H., Professor, University Maastricht, The Netherlands & Zwarts, M.J., Professor, University Medical Centre St Radboud, the Netherlands. Electromyographic Fatigue in Sprinters versus Endurance Athletes.

**11:00 -12:30 Session II: Training and Performance**

**Chair:** Minshull, C., Senior Lecturer, Nottingham Trent University, UK.

1. De Villiers, E., Biokineticist, Stellenbosch University, South Africa & Venter, R.E., Lecturer, Stellenbosch University, South Africa. The Effect of Barefoot Training on Speed, Agility, Power and Balance in Netball Players.
2. Konstantaki, M., Lecturer, Buckinghamshire New University, United Kingdom & Barlow, C., PhD Student, Buckinghamshire New University, UK. Effects of Menstruation on Sprint Performance in Female Rugby Players.
3. \*Saha, S., Lecturer, University Sains Malaysia, Malaysia & Saha, S., Lecturer, University Sains Malaysia, Malaysia. Recovery Ratio from Autonomic Orienting Response as Predictor of High Performance in Cricket.
4. Van den Berg, P., Lecturer, North West University, South Africa. The Effect of the ELVs (Experimental Law Variations) on the Super 14 Rugby Union Tournaments.

**12:30-13:30 Lunch**

**13:30-15:00 Session III: Physical Activity and Health across the Lifespan**

**Chair:** Konstantaki, M., Lecturer, Buckinghamshire New University, U.K.

1. Cacek, J., Vice Head of Department, Masaryk University, Czech Republic. The Rate of Obesity - An Indicator of Fitness in Different Age and Gender Groups of the Population of the Czech Republic.
2. Bryan, A., Assistant Professor, Columbus State University, USA, Green, J.M., Associate Professor, Jacksonville State University, USA, Black, S., Professor, The University of Alabama, USA & Bishop, P., Professor, The University of Alabama, USA. Physical Independence: Examining Older Adults' Perceptions of Physical Limitations.
3. Fletcher, R., Lecturer, Massey University, New Zealand & Barker, K., Lecturer, Massey University, New Zealand. Resistance Training and the Elderly: An Investigation into Wellbeing and Life Satisfaction.
4. Yamauchi, J., Associate Professor, Tokyo Metropolitan University, Japan. Relationship between Foot Grip Force and Leg Muscle Force Generating Capacity in Middle-Aged and Elderly Individuals.

**20:30-22:30 Greek Night and Dinner (Details during registration)**

**Tuesday 26 June 2012**

**09:00-10:30 Session IV: Motor Control**

**Chair:** \*Saha, S., Lecturer, University Sains Malaysia, Malaysia

1. Korvas, P., Associate Professor, Masaryk University, Czech Republic, Sebera, M., Faculty Member, Masaryk University, Czech Republic, Musil, R., Faculty Member, Masaryk University, Czech Republic & Kolarova, K., Faculty Member, Masaryk University, Czech Republic. Preliminary Research of Plantar Pressure and Time Characteristics during Walking.
2. Olivier, B., Lecturer, University of the Witwatersrand, South Africa, McKinnon, W. Professor, University of the Witwatersrand, South Africa, Stewart, A., Professor, University of the Witwatersrand, South Africa & Olorunju, S., Professor, University of the Witwatersrand, South Africa. The Influence of Injuries Sustained Prior and During a Cricket Season on Lumbar Movement Control, Static and Dynamic Balance Ability in Cricket Fast Bowlers.
3. Duquette, A., Kinesiology Laboratory Coordinator, University of Windsor, Canada. A Method for Examining Reaction Time, Movement Time, and Attentional Focus during a Simulated Driving Task with and without Cell Phone Texting.
4. Dehner, C., Trauma Surgeon, University of UIM, Germany. Postural Control Deficit in Acute QTF Grade II Whiplash Injuries. . (Tuesday, 26<sup>th</sup> of June, 2012)

**10:30 -12:00 Session V: Health and Sports Psychology**

**Chair:** Constantinou, P., Associate Professor, Ithaca College, USA.

1. Bentley, M., Associate Professor, Ithaca College, USA. Learn Through Practice: The Critical Examination of Individualism in Global Chronic Disease Prevention.
2. Broodryk, R., Junior Subject Specialist, North West University, South Africa. Comparison of Coach and Player Perceptions on Coaching Efficacy in Club Level Rugby Union.
3. D'Acerno, M.R., Professor, University of Parthenope, Italy. Anxiety and Physical Education. (Tuesday, 26<sup>th</sup> of June, 2012, morning)
4. Leach, L., Lecturer, University of the Western Cape, South Africa. The Impact of Multiple Health Behaviour Intervention Strategies on Coronary Heart Disease Risk Factors in First Year University Students.

**12:00 -13:30 Session VI: Socio-cultural Topics in Physical Education and Health**

**Chair:** Bentley, M., Associate Professor, Ithaca College, USA

1. Kolander, C., Director, University of Louisville, USA & Benson, P., University of Louisville, USA. . Curbing Health Care Costs through Health Care Management.
2. Constantinou, P., Associate Professor, Ithaca College, USA. The Overwhelming Many Vs the Essential Few: Rethinking Teacher Preparation.
3. Sekot, A., Professor, Masaryk University, Czech Republic. Physical Activity as a Sociological Phenomenon.
4. Kodra, E., Assistant Professor, UST, Albania, Kovaci, F., Lecturer, UST, Albania, Skenderi, D., Lecturer, UST, Albania & Bendo, A., Lecturer, UST, Albania. How can Future Talents of 8-14 Years Old be Identified in Different Sports' Disciplines.

**13:30-14:30 Lunch**

**14:30 -16:00 Session VII: Physical Activity, Fitness and Performance**

**Chair:** Sekot, A., Professor, Masaryk University, Czech Republic.

1. Chia, M., Professor, National Institute of Education, Singapore. Quality of Life-Physical Activity-Body Mass Index-Academic Performance Nexus among Primary School Pupils in Singapore.
2. Saha, S., Lecturer, University Sains Malaysia, Malaysia, Saha, S., Lecturer, University Sains Malaysia, Malaysia, Krasilshchikov, O., Lecturer, University Sains Malaysia, Malaysia & Saat Ismail, M., Lecturer, University Sains Malaysia, Malaysia. Impact of Accuracy in Anticipation on Decomposition of Autonomic Tonic and Phasic Responses as Predictor of Performance Excellence in Malaysian Swimmers.
3. Psalman, V., Associate Professor, Masaryk University, Czech Republic, Sebera, M., Assistant Professor, Masaryk University, Czech Republic, Duvac, I., Assistant Professor, Masaryk University, Czech Republic, Zvonar, M., Assistant Professor, Masaryk University, Czech Republic & Jirio Zhanel, Assistant Professor, Masaryk University, Czech Republic.

Pattern of Gait Analysis in Women -Case Study

**17:00-20:00 Urban Walk (Details during registration)**

**20:00- 21:00 Dinner (Details during registration)**

**Wednesday 27 June 2012**

Cruise: (Details during registration)

**Thursday 28 June 2012**

Delphi Visit: (Details during registration)

**Mary Bentley**

Associate Professor, Ithaca College, USA

## **Learn Through Practice: The Critical Examination of Individualism in Global Chronic Disease Prevention**

This paper will describe a pedagogical practice, that is now a part of a undergraduate class titled Wellness: Multicultural perspectives on Health and Healing, called, five for five. As a part of the experience students are required to learn and practice 5 health behaviors for an entire month, with the goal of doing all 5 for 5 days in a row. These behaviors have copious evidence based clinical research that establishes them as health promoting, and can be practiced over the entire lifespan. The behaviors are:

1. Aerobic Exercise for 30min. In target heart rate zone.
2. Resistance training in all major muscle groups for 3 day out of 5 days,
3. 20 minutes of mindful meditation,
4. Eating at least 5 servings of vegetables per day, and
5. Getting, sleeping at least 7 hours per night.

In the classroom we discuss the complexity of behavior change and the importance of establishing behaviors as young adults, in maintaining these as we age. We also discuss each practice, and specific skills that are required. Basic information such as serving size, heart rate and exercise, weight training basics, sleep hygiene, and forms and proaices of meditation are the focus of classroom time before the month begins. Social support and Transtheoretical model of behavior change are covered in detail, to provide a framework, and support for individual behavior change. Other systems of Health and Healing are also introduced, with a emphasis on traditional Chinese medicine, allopathic or wester medicine, and Ayruveda. The concept of prevention is critically examined within these three majors systems of healing, as well as the differences in scientific method and clinical trials.

When students take these understandings of the mind, body and culture into their practice of behavior change, there is a deeper level of involvement. They really try and are graded on their effort and understanding of the modalities. This experience is very difficult, and most of the students if they complete it, have a difficult time with several of the 5 practices. As future practionior of prevention, it is critical for us to really understand what we are asking of people. It is nearly impossible for most people on the planet to really practice these basics of health living. Changes in work, food, and family, have make

these basics of healthy living extras tasks in daily living, available to only a few. Even with this level of support, very early in their lives, it is difficult or impossible for many college students to practice 5 behaviors for 5 days.

We need to look beyond the individual in even the best of circumstances to re-capture a connection to our bodies and daily practices. Individualism, has preceded a global increase in chronic disease, and has grown new disparities of health along old lines of race, class and gender. Working conditions, and a livable wage, food availability, health education, quiet contemplation and rest, cooking and eating together are not new age western concepts. Supporting these may go much further in disease prevention and health promotion than another pill shot or surgery to correct the individual from chronic disease.

**Retief Broodryk**

Junior Subject Specialist, North West University, South Africa,

**Annamarie Kruger**

Professor, North West University, South Africa

&

**Pieter Van den Berg**

Lecturer, North West University, South Africa

## **Comparison of Coach and Player Perceptions on Coaching Efficacy in Club Level Rugby Union**

**Purpose:** The aims of this study were to determine the players' perceptions on their coaches' coaching effectiveness and to compare those results with the coaches' perceptions on their own coaching effectiveness.

**Method & Materials:** One hundred and forty two players from the Puk Rugby institute (PRI) were asked to fill in the adapted version of the Coaching Efficacy Scale (CES) (Feltz et al., 1999) and 12 coaches of the PRI were asked to fill in the CES (Feltz et al., 1999). The CES consists of four subscales measuring motivation (7 items), game strategy (7 items), technique (6 items) and character building (4 items). Each item was rated on a 9 point Likert scale from 0 (not at all effective) to 9 (extremely effective). The purpose of the questionnaire was thoroughly explained to the players and coaches while participants were repeatedly reminded of the anonymous nature of the questionnaires.

**Results:** Strong alpha cronbach values were established for all four constructs on the specific population. The results from the mixed models indicated a statistical significant difference ( $P \leq 0.05$  = statistical significance) on all four constructs which measures the players' and coaches perceptions on coaching efficacy.

**Conclusion & Applications:** A statistical significant difference exists between the coaches' and players' perception of the respective coaches' coaching effectiveness. In View of the inconsistency between the coaches and players perceptions of coaching effectiveness, coaches and clubs need to be more aware of the relevance of players' input concerning coaching effectiveness.



**Alicia Bryan**

Assistant Professor, Columbus State University, USA,

**Matthew J. Green**

Associate Professor, Jacksonville State University, USA,

**Sheila Black**

Professor, The University of Alabama, USA

&

**Phillip Bishop**

Professor, The University of Alabama, USA

## **Physical Independence: Examining Older Adults' Perceptions of Physical Limitations**

This investigation examined older adults' perceptions of physical limitations in comparison to their actual physical performance. Fifty independent living older adults (65-91 years) were interviewed to participate in the study. Their perception of physical limitation was measured through the use of a questionnaire which focused on assessing health related limitations in various physical activities. These activities were broad ranged and represented basic to vigorous options typically engaged in by this age group. Participants' perception scores were categorized as physically "independent" or "moderately dependent". Perception data were compared with actual physical performance measures assessed by the Timed-Up-and-Go test (TUG). Age and gender-specific normative standards were utilized to classify the study participants as performing "above average/normal" function or "below average/at risk" for loss of functional mobility. Health history was also obtained and used to determine the number, types and severity of medical conditions among individual participants. Since these data were self-reported, cognition was assessed utilizing previously validated instruments.

**Jan Cacek**

Vice Head of Department, Masaryk University, Czech Republic

## **The Rate of Obesity - An Indicator of Fitness in Different Age and Gender Groups of the Population of the Czech Republic**

In this paper the authors deal with the evaluation of the average degree of obesity in different age and gender groups of the adult population in the Czech Republic. Several main indicators of obesity were investigated: Body Mass Index (BMI), % body fat, visceral fat, fitness score.

These defined indicators of obesity were measured by bioimpedance (device InBody720 - diagnostics of body composition). The initial stage of the research was realized in the second half of 2011 on a sample of 603 individuals (319 women, 284 men) divided into 6 age groups (18 - 29 years, 30 - 39, 40-49, 50 - 59, 60 - 69, 70 +).

The results show that Czech adult males have significantly ( $p < 0.01$ , t test) higher BMI values (mean 26.91, SE 0.28) than Czech women (mean 25.18, SE 0.23). The average BMI of the Czech population is located within the "overweight" zone or pre-obesity of the standard scale. When considering the average distribution of BMI in pre-defined age groups, we can say that average BMI values increase in both men and women with increasing age. Values of the fitness score (the ratio of muscle mass and body fat calculated from the standardized value 80) in men significantly ( $p < 0.01$ ) differ from those of women. The average score in men was 78.51 (SE 0.55), while in women it was only 72.73 (SE 0.44). These results indicate a higher proportion of fat and a lower proportion of muscle in women. With increasing age, the average fitness score decreases, and the decrease is significantly steeper in women than in men. The average value of visceral fat was 113.76 cm<sup>2</sup> (SE 2.85) in men and 86.85 cm<sup>2</sup> (SE 2.27) in women. Differences between men and women were significant ( $p < 0.01$ ). The amount of visceral fat significantly increases with increasing age in both groups. The average value of subcutaneous fat was 31.32% (SE 0.41) in women and 21.78% (SE 0.52) in men. The results are statistically significant ( $p < 0.01$ ). With increasing age, the average value grows very markedly, particularly in the two oldest age groups.

These results lead to following conclusions:

- The Czech population has an average BMI value in the overweight zone, and men show significantly higher values than women. With increasing age, the values of BMI increase significantly.

- The average fitness score of the Czech population is lower than the normative value (80 points). Only 3 youngest age groups of men show a higher average value than 80. With increasing age, the value of this indicator decreases. We recommend to use it as an additional indicator of obesity.

- Except two youngest age groups of men and women, the Czech population has a higher percentage of fat than recommended as the optimum by manuals of the Biospace company (the manufacturer of InBody). The average percentage of body fat increases with increasing age.

- The Czech population shows a tendency towards increasing values of visceral fat from the youngest to the oldest age groups. Average values of visceral fat in various age groups match the standards of the "normal" risk-free population. The amount of visceral fat normally increases with age.

**Michael Chia**

Professor, National Institute of Education, Singapore

## **Quality of Life-Physical Activity-Body Mass Index-Academic Performance Nexus among Primary School Pupils in Singapore**

### **Objective:**

The research investigates the health-related quality of life of lower primary school students in two schools (Beacon Primary School and an equivalent and matched school; N=720), using an established paediatric quality of life programme model (PedsQL). Beacon Primary has an Interactive-Digital-Media-enriched environment and also uses an integrative Wellness Channel to teach physical education, health education, civics and moral education and pastoral care. This is achieved through daily physical education lessons and the main objective of the Wellness Channel is to develop pupils holistically in the physical, emotional, social and cognitive domains. Another objective of the research is to quantify the amount of accumulated physical activity in Beacon Primary School (EXPT) and an equivalent and matched primary (CON) school.

### **Results:**

School-based step count remained mostly unaltered in the CON school while it increased nearly 50% in boys and 40% in girls in the EXPT school from pre-to-post conditions. However, in both schools, total daily step count was unaltered. Boys and girls, respectively accomplished 52-58% and 72-76% of the recommended daily accumulated step count of 16 000 for boys and 13 000 for girls. Pupils from both schools had similar high scores for Total Health (81 versus 80%). After the intervention, pediatric quality of life improved significantly (3%,  $p<0.05$ ) for EXPT School pupils with no change for CON School pupils. Additionally, pooled data of both schools demonstrated that a higher BMI negatively affected academic performance while a higher Total Health score was associated with higher academic achievement.

### **Conclusions:**

Quality of life improved significantly with daily scheduled bouts of learning via physical activity and that academic performance was associated with a lower BMI and higher quality of life score among primary school pupils in Singapore.

**Phoebe Constantinou**  
Associate Professor, Ithaca College, USA

## **The Overwhelming Many Vs the Essential Few: Rethinking Teacher Preparation**

This presentation will focus on identifying essential skills needed by beginning physical education teachers of the 21st Century. Often today's physical education teacher candidates are overwhelmed with the amount of information they need to learn and skills they are expected to master in order to become educators. This paper will argue that "less is more", and that focusing on mastering essential teaching skills might be more effective and beneficial for the generation of the 21st Century. In general, the 21st century generation consists of independent and technology savvy individuals who are not afraid to challenge authority and question the status quo. For the most part, this generation has a short attention span and cannot stay focus on a single task too long. This kind of knowledge might help us understand why most of our teacher candidates have difficulties reading textbooks or staying awake when been lectured. On the other hand, multitasking is a second nature for them and they can easily carry on a conversation while handling email on smart phone and scrolling the web on a computer. As an older generation we expect a face-to face meeting on important matters while the 21st century generation prefers virtual communication such as an email or a two word text. It is by far, a generation of few words and right to the point skills, thus, it is critical that we align the goals of teacher preparation with the demands of this new generation.

Below is a list of teaching skills that physical education teacher candidates identified as essential teaching skills to be master prior to teach that will be discussed.

- Effective lesson planning
- Managerial Skills/organization
- Creating positive learning environment
- Providing feedback
- Being an inspiring teacher (approachable, caring, fun, enthusiastic)
- Knowledgeable(content knowledge , diversity)
- Clear demonstrations/presentation of tasks
- Variety of teaching styles
- Knowing how to assess students learning
- Reflective

**Maria Rosaria D'Acierno**

Professor, University of Parthenope, Italy

## **Anxiety and Physical Education**

Anxiety or worry is a particular psychological and physiological state which can occur at any age without an easily identifiable stimulus. It is related to uncontrolled situations (Ohman 2000) and the subject develops the perception of being not sufficient prepared to cope with upcoming events.

It might have: physical (hearth palpitation, blood pressure, etc.) emotional (irritability, restlessness, etc. - Smith 2008) and cognitive (fear of dying - [www.anxietycentre.com](http://www.anxietycentre.com)) effects.

Our research considers adolescents (a group of 15), especially those who as infants had been highly apprehensive because they had serious health problems (one of these a mild not invalidating poliomyelitis). These children developed an unsure behaviour, also because they suffered for their parents' apprehension (Cutting, Hardy, Thomas, 1997). We suggested them to regularly attend a course three times a week for one hour each, mixing with other adolescents who seem to have no problems. Combining the rhythm of music with the movement of the body offers them balance both physical and emotional (Scarre 1995). Furthermore it relaxes them while giving them a certain self-confidence in realizing that everybody is not perfect. In fact, all children, especially at the beginning, show not only uncoordinated movements but also a kind of careless (Andrews et al. 2010). Practising as well as trying to follow music as much as possible through imitation stimulates children to socialize, to interact, and to experience the world of others (Heide et al. 1983). The experiment started last October (2011) will last until next June (2012).

**Elbé De Villiers**

Biokineticist, Stellenbosch University, South Africa

&

**Ranel E. Venter**

Lecturer, Stellenbosch University, South Africa

## **The Effect of Barefoot Training on Speed, Agility, Power and Balance in Netball Players**

**Background:** Recent developments in the running industry have led to extensive research on the effects of barefoot running on kinetics, kinematics and energy expenditure. Barefoot running has shown to increase running economy and in some instances decrease impact forces. Inconclusive evidence exists as to whether barefoot training improves proprioception and muscle strength. It is also unclear if barefoot training could improve physical performance in athletes.

**Aim:** To determine the effects of barefoot training on speed, agility, power and balance in netball players.

**Methodology:** Twenty women netball players (age:  $20 \pm 2$  years) volunteered to participate, and were randomly assigned to the barefoot (experimental) group (BF) ( $n = 10$ ) and the shod (control) group (SH) ( $n = 10$ ). Participants had to attend at least 14 training sessions over a period of eight weeks, where the BF group gradually increased the volume and intensity of barefoot training. Speed, agility, vertical jump height, single leg stability and lower leg circumferences were measured pre- and post intervention.

**Results:** BF showed a significant improvement in agility to the left ( $0.14\text{sec} \pm 0.10\text{sec}$ ;  $P=0.02$ ) and right ( $0.19\text{sec} \pm 0.07\text{sec}$ ;  $P=0.00$ ). A significant improvement ( $P=0.01$ ) in single leg stability was found in the right leg in the anterior/posterior, medial/lateral ( $P=0.04$ ) and overall stability ( $P=0.01$ ) for BF. All stability measurements, except the left anterior/posterior index, showed a small significant practical improvement post-intervention. A large practical significant effect ( $ES=1.01$  and  $ES=0.80$ ) was found in the speed test over 10- and 20-metres respectively. No statistically significant increases were found in the lower leg circumferences or the vertical jump height. The results showed that barefoot training resulted in improved agility and single leg stability, compared to shod training. In conclusion, it can be deduced that barefoot training has a positive effect on agility and ankle stability, thus possibly leading to improved performance.

**Christoph Dehner**

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## **Postural Control Deficit in Acute QTF Grade II Whiplash Injuries**

**Introduction:** Tetra-ataxiometric posturography in chronic pain patients after whiplash injuries of the cervical spine has revealed an impaired regulation of balance. However, so far it is unclear if this is caused by the accident or other factors that are associated with the pain chronification process. Studies with patients with acute whiplash injuries have not been performed so far.

**Aim:** The objective was to investigate the balance control in patients with acute QTF grade II whiplash injuries of the cervical spine.

**Methods:** 40 patients with acute QTF grade II whiplash injuries and 40 healthy matched controls were examined in an experimental in-vivo study on a dynamic posturography platform. The stability index  $ST\Sigma$  and the Fourier analysis  $FA\Sigma$  (0.10-1.00Hz) were established for eight standing positions and sum scores were calculated. The pain index was established using a visual analog scale ranging from 0-100. A follow-up examination was conducted for the patients after two months.

**Results:** The patients with acute whiplash injuries of the cervical spine achieved significantly poorer results for both  $ST\Sigma$  and  $FA\Sigma$  than the healthy controls. There were no differences between the eight standing positions for both  $ST\Sigma$  and  $FA\Sigma$ . After two months 17 patients had no change in the pain development, 21 patients showed an improvement in the pain intensity and 2 patients deteriorated. The subgroup of patients with improvement of the pain intensity showed a significant improvement of the balance control concerning the  $FA\Sigma$  compared to patients with unchanged pain intensity.

**Conclusion:** Patients with acute whiplash injuries have a reduced balance control as compared to matched controls. This study indicates that acute posttraumatic neck pain could be associated with reduction of the balance control.



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## **A Method for Examining Reaction Time, Movement Time, and Attentional Focus during a Simulated Driving Task with and without Cell Phone Texting**

Decreasing the time taken to formulate a stimulus response (Reaction Time: RT) and/or decreasing the time taken to execute that response (Movement Time: MT) is crucial while driving. Cell phone use (specifically texting), is believed to divide the Attentional Focus (AF) of the driver, thus increasing the RT and MT.

**Objectives:** A method for examining RT, MT, and AF during a simulated driving task was developed for the students enrolled in a Laboratory Experience course to determine whether AF would be divided enough during texting to affect RT and MT.

**Methods:** RT and MT in response to a light stimulus on a computer based interface using foot actions on a 'gas' and 'brake' pedal while driving an automatic transmission vehicle were recorded. During the 'simulated driving without cell phone texting task' (10 trials), students held their foot on the right side of the foot switch mat (depressing the 'gas pedal'). When the stimulus (traffic or brake light) turned red, they lifted their foot off of the right side of the foot switch mat and pressed the left side of the foot switch mat (depressing the 'brake pedal'). RT was recorded as the time to release the 'gas pedal', while MT was the time from 'gas pedal' release to 'brake pedal' depression. During the 'simulated driving with cell phone texting task' (10 trials), a text box was presented on the screen during 'gas pedal' depression that the students were required to type.

**Results:** RT and MT consistently increased during the 'simulated driving with cell phone texting task', when compared to the 'simulated driving without cell phone texting task'.

**Conclusions:** Results suggested that the increase in RT and MT during the 'simulated driving with cell phone texting task' was due to the divided AF of the students participating in the Laboratory Experience.

**Richard Fletcher**

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## **Resistance Training and the Elderly: An Investigation into Wellbeing and Life Satisfaction**

Wellbeing and life satisfaction in the elderly is becoming an important issue given an increasingly aging population. Exercise has shown to be an effective mechanism for maintaining function and health in older populations. The research documenting the psychological benefits of exercise within the elderly are sparse within the New Zealand context. Thus the aims of the research were to investigate the effects of a resistance training program on an elderly population (mean age = 74.09, sd = 3.1). Participants were randomly assigned to either a control (n = 39, males = 19, females = 20) or the resistance training group (RTG) (n = 38, males = 20, females = 18). The RTG received a 12-week progressive training program specifically designed for each individual based on common training principals. Ethical approval for the research, as well as informed consent was obtained for all participants. Furthermore all participants underwent a comprehensive medical evaluation before starting the program. Data were collected at three time points (week 1, 6, 12) on a variety of psychological variables, for example the Purpose in Life Test (PIL), and the Profile of Mood States (POMS) as well as strength. Repeated measures analysis of variance revealed significant differences between the two groups on the following variables, strength, PIL, and the POMS subscales, tension, depression, anger, fatigue, confusion, vigour, and friendliness. Results are discussed with practical implications in mind.

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## **Electromyographic Fatigue in Sprinters versus Endurance Athletes**

Sprinters and endurance athletes (EA) have genetically a different proportion of the type I (fatigue-resistant) and type II (fatigable) muscle fibers. We investigated whether there are differences between sprinters and EA in the surface electromyography (sEMG) of their not-specifically trained muscles during fatigue. sEMG fatigue is characterized by slower conduction along the muscle fibers.

Subjects (sprinters  $n = 14$ ; EA  $n = 16$ ) were seated in a chair. The upper arm was supported at  $45^\circ$  of shoulder flexion; the lower arm was free. The subjects swung the lower arm over  $45^\circ$  at a rate of 40 cycles per minute. The force levels were up to 20% of the maximum voluntary contraction. sEMG was obtained from the biceps brachii muscle using an electrode array. From the sEMG signal, velocities of the motor unit potentials (peaks) were elicited. From these peak velocities, three variables were derived: mean muscle fiber conduction velocity (which is an average of the peak velocities), within-subject skewness of the peak velocities (skewness) and within-subject standard deviation of the peak velocities (SD).

Overall, muscles of the sprinters showed a greater proportion of the faster propagating peaks (skewness). During fatigue, the changes in the SD differed significantly between groups: the SD of the sprinters increased progressively whereas that of the EA did not change. Sprinters showed a larger proportion of both very fast and very slow peaks, while their total number of the peaks was smaller than in EA.

In conclusion, we found indeed differences between sprinters and EA in their sEMG fatigue. The pattern of fatigue in the sprinters suggests that they activate a larger proportion of the type II fibers than the EA do. These fibers would conduct very fast when fresh and very slow when fatigued. As the muscle was not-specifically trained, the results suggest inherited properties.

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&  
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## **Curbing Health Care Costs through Health Care Management**

The University of Louisville is a state supported research university with approximately 6500 employees (faculty and staff), 21,000 students, and an annual \$1.1 B budget. A decade ago, the university experienced double digit increases in health care costs. Today, the university experiences \$3 in savings for every \$1 spent because of Get Healthy Now (GHN), its health management program.

GHN is an award winning collaboration between the College of Education and the Division of Human Resources. GHN is strictly an incentive (carrot) based program. Employees receive a \$40 monthly premium incentive and other perks earned for participation in on-site initiatives. Participation begins with the completion of a Health Risk Assessment (HRA). Nearly 75% of employees choose to participate in GHN.

All employees can enjoy the employee-dedicated fitness facility with three rooms: strength training, cardio, and assessments. Nationally certified personal trainers and wellness coaches, as well as students seeking certification, are available to provide support to people desiring a program tailored to their specific needs.

GHN offers an array of opportunities for involvement in many wellness initiatives. Services include Empowered Health Coaching, Health and Fitness Assessment, Workout Design, and Wellness Coaching. Programs/Classes change regularly and include activities such as biking initiatives, boot camp, move it or lose it, smoking cessation, take 20 to relax, and zumba.

Personal success programs with biometric data are shared regularly via the dedicated website and daily university emails. For the past four years, the American Heart Association has named UofL a Gold Award "fit friendly employer" and this year, the program secured Platinum recognition. GHN received the first Louisville Business First award for employee wellness in companies with over 5000 employees.

We will share the lessons learned and suggestions for business/university partnerships to create healthy environments for employees and their families.

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&

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## **Effects of Menstruation on Sprint Performance in Female Rugby Players**

Previous research has investigated the effects of menstruation upon anaerobic performance using the Wingate test (REF) whilst there has not been any research conducted in to how weight bearing exercise is affected by menstruation. The purpose of this study was to investigate if the menstrual cycle affects performance in a 60m sprint. Twelve female trained rugby players (mean  $\pm$  SD: age  $26.0 \pm 8.0$ , stature  $164.5 \pm 5.5$  cm, body mass:  $69.32 \pm 2.78$  kg) signed an informed consent and participated in the study. Subjects performed three trials of a 60m sprint test with 5 min rest in between trials under two conditions; during menstruation and during the luteal phase of the menstrual cycle. The time to complete the 60m sprints was recorded using Brower wireless timing gates. Body temperature was recorded in degrees Celsius using a Braun Thermoscan tympanic thermometer. The test was conducted on a same grass surface at the same time of day and similar environmental temperature in both conditions. Results showed that mean body temperature increased significantly during menstruation (non-menstrual:  $35.9 \pm 0.4$  °C menstrual:  $36.6 \pm 0.5$ °C;  $P= 0.04$ ). The time to complete the 60m sprint was shown to be higher during menstruation for best sprint times (menstruation:  $11.97 \pm 0.81$  s vs non-menstruation:  $11.69 \pm 0.83$  s,  $P= 0.0001$ ). These results contrast those shown previously for anaerobic power where performance is not affected during the menstrual cycle. However, the findings of this study indicate that the menstrual cycle has an effect upon maximal speed in weight bearing activities. This could be an important consideration for female athletes participating in multiple sprint sports.

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## **Preliminary Research of Plantar Pressure and Time Characteristics during Walking**

Purpose of the study is to assess plantar kinetic characteristics of adults over 18 while walking. Walking variability is both a biomechanical and an orthopedic problem. Individual techniques may influence the economy of movement or cause problems with the support or locomotive systems. The quality of walking is influenced by foot architecture and biomechanical properties of an individual as well as other factor such as body weight, muscle fatigue, the location of the body center etc.

The aim of the study is to set basic representative dynamic parameters of walking which can affect walking effectiveness and economy.

With the help of PEDAR mobile device, 31 adults (26 – 60 years old) were observed while walking. Selected kinetic parameters of walking have been observed. We focused on time characteristics of the walking cycle and plantar pressure while the foot contacts the floor as average and maximal plantar pressure, contact time and plantar pressure during active and passive parts of the step, area of foot contact during step. Body weight, height, and age of tested persons were recorded and BMI calculated. Laterality of lower limbs was found out through test. The physical activity assessment of the participants with a focus on utilizing walking was carried out through a questionnaire. Wilcoxon test, analysis of variance and factor analysis for statistic evaluation was used.

Factor analysis revealed that the selected strength, time and area variables (n=28) which characterize the activity of the plant are possible to be reduced down to four representative parameters. In a heterogeneous group regarding age, body proportions and BMI a logical significant differences appeared for mean and maximum plantar pressure during regular walk when we divided all participants into

groups with optimum weight and overweight according to BMI below or over 25 respectively. Mean value of plantar pressure during the whole course of contact was 0.8 times the body weight for both groups divided according to BMI, maximum pressure reached 1.1 times the body weight in the group with index over 25; and 1.2 times the body weight in the group with lower BMI. We found differences between right and left foot maximal plantar pressure for all group during the step ( $p = 0,004$ ) and for maximal pressure between both feet during active part of step ( $p = 0,002$ ), but laterality was not significant for this variable (Wilcoxon test,  $p=0.35$ ). Any significant differences ( $p<0.05$ ) regarding time characteristics of step were not found.

For further research, it is necessary to adjust the range of observed parameters. We found difference of plantar load between right and left but the follow-up survey is necessary.

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&

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## **How Can Future Talents of 8-14 Years old be Identified in Different Sports' Disciplines?**

Identifying the new sport talents is of ultimate importance for both sport specialist and the teachers of physical education. Through the application of general tests, we are able to identify the best pool of talented individuals that show the potential to race in different sports disciplines.



**Lloyd Leach**

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## **The Impact of Multiple Health Behaviour Intervention Strategies on Coronary Heart Disease Risk Factors in First Year University Students**

**Background:** There is a compelling body of evidence that coronary heart disease (CHD) risk factors are present in people of all ages. The extent to which the problem exists in university students in South Africa (SA) has not been confirmed in the literature. Furthermore, the effects of physical activity, physical fitness, diet and health behaviours on CHD risk factors has not been studied extensively in SA and needs further investigation.

**Aim:** The aim of the study is to assess the impact of multiple health behaviour intervention strategies on CHD risk factors in first year students at the University of the Western Cape (UWC). It was hypothesized that exposure to various health behavioural interventions would reduce CHD risk factors in subjects at moderate risk.

**Methods and Study Design:** An experimental study design was used wherein subjects at moderate risk for CHD were identified and exposed to multiple health behavioural interventions for 16 weeks in order to determine the impact of the various interventions on CHD risk factors.

**Population and Sample:** The target population consisted of first year students at UWC aged 18 - 44 years who were screened and a sample of 173 subjects were identified as being at moderate risk for CHD. Next, the subjects were randomly assigned to a control and four treatment groups, namely, health information, diet, exercise, and a multiple group that included all three treatments. The intervention, based upon Prochaska's trans-theoretical model of behaviour change, continued for a period of 16 weeks and, thereafter, the subjects were re-tested.

**Data Collection Process:** Subject information was obtained using self-reported questionnaires, namely, the physical activity readiness questionnaire (PAR-Q), the stages of readiness to change questionnaire (SRCQ), the international physical activity questionnaire (IPAQ), and the healthy lifestyle questionnaire (HLQ), together with physical and hematological (blood) measurements. The CHD risk factors measurements taken before and after the intervention programme were family history, cigarette smoking, hypertension, obesity, dyslipidemia, impaired fasting glucose and a sedentary lifestyle

**Types of interventions:** A control group was used in which subjects did not receive any treatment. The health behavioural interventions

were arranged into four groups of subjects that received either health information, diet, exercise or a combination of all three individual treatments.

**Statistical analyses of data:** In the analyses of the data, the procedure followed was that where the outcome variable was approximately normally distributed, the groups were compared using a two-sample t-test. For outcomes with a highly non-normal distribution or ordinal level data, the nonparametric Wilcoxon Rank Sum test was used for group comparisons. To account for baseline differences, repeated measures analysis of variance was used. In the case where nonparametric methods were appropriate, analysis was done using Cochran-Mantel-Haenszel (CMH) methodology stratifying on the baseline values. For the case of nominal level outcomes, groups were compared by Chi-square tests for homogeneity of proportions. When baseline values needed to be incorporated into the analysis, this was done using CMH methodology.

**Main Outcome Measures:** The main outcome measures tested in the study related to modifiable CHD risk factors, namely systolic and diastolic blood pressure, cigarette smoking, total cholesterol (TC) concentration, high-density lipoprotein (HDL) cholesterol concentration, low-density lipoprotein (LDL) cholesterol concentration, triglycerides, fasting glucose, body mass index, waist circumference, waist-hip ratio and physical inactivity.

**Results:** The results showed significant decreases for body mass, waist and hip circumferences, resting heart rate, diastolic blood pressure, cigarette smoking and a sedentary lifestyle ( $p < .05$ ). No significant differences were recorded for blood biochemistry, however, favourable trends were observed in the lipoprotein ratios. A substantial net reduction in CHD risk factors as well as in cumulative risk was achieved with treatment that impacted positively on the re-stratification of participants at moderate risk. In terms of treatment efficacy, the dietary intervention appeared to be the least effective (10.91%), with health information and exercise sharing similar levels of efficacy (32.81% and 33.93%, respectively) and, the combined treatment in the multiple group stood out as the most effective treatment (50.00%), and supported the hypothesis of the study.

**Conclusions:** The net and cumulative decline in CHD risk factors was substantial with treatment and was directly related to the number of treatments administered. The evidence suggests that such multiple health behaviour interventions when implemented through a university-based setting have substantial benefits on reducing CHD risk and may be of considerable public health benefit.

Despite being a relatively educated population, a substantial number of first year university students are at considerable heart disease risk.

Physical inactivity constitutes one of the main CHD risk factors amongst first year students and, together with smoking, place many of them at moderate CHD risk.

The effectiveness of health behavioural strategies designed to modify lifestyle and prevent coronary heart disease is supported by this study.

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## **The Position of the Centre of Mass during the Support Phase of Forward Somersaulting Skills on the Trampoline**

One popular theory regarding the generation of angular momentum for forward somersaulting suggests that placing the center of mass (COM) in front of the base of support with the supporting surface pushing vertically upward provides the torque required to initiate rotation. Another theory suggests that the COM remains over the base, and that the feet push downward and forward into the supporting surface to provide the torque causing rotation. These two theories are mutually exclusive. This study used slow motion film to analyze the COM motion during forward somersaulting skills on the trampoline to determine which theory might be correct. Analysis of five expert performances indicated that the COM remained over the base of support throughout the take-off in every case, and that the torque was generated by pushing forward and downward with the feet into the supporting surface. In every performance, the performer developed a forward velocity before or immediately after contact with the surface that continued until just prior to take-off of the somersaulting skill, at which time a sharp backward acceleration occurred. This acceleration arrested the forward motion and provided the torque that caused rotation. This allowed the performer to complete the skill with very little horizontal motion during the performance. In none of these performances did the COM move in front of the base of support. A sixth performance, deliberately attempting to perform the skill by placing the COM in front of the base, showed that although it is possible to generate some angular momentum in this manner, this was not a viable method in terms of acceptable performance because of reduced height and large horizontal displacement during the performance. It is hoped that this research may enlighten teachers, coaches and authors about the true nature of initiating rotation in forward somersaulting skills.

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## **Effects of Passive Versus PNF Stretch Conditioning on Neuromuscular Activation and Sensorimotor Performance**

### **Introduction**

Enhanced flexibility has been associated with protection from injury and conditioning for range of motion is an integral component within many physical therapy interventions. Popular and efficacious modes include passive stretching and proprioceptive neuromuscular facilitation (PNF). Whilst superior flexibility might convey a protective effect against musculoskeletal injury, consequence of stretching may also involve impaired muscle performance and increased risk of synovial joint injury.

### **Methods**

The effects of flexibility conditioning on neuromuscular and sensorimotor performance were assessed near to full knee extension (25°). Eighteen males that were randomly assigned into two groups underwent eight weeks (three-times weekly) of flexibility conditioning (hip region/knee flexor musculature; dominant limb) involving either PNF (n=9; 20.3 ± 2.2 yrs; 1.77 ± 0.05 m; 71.9 ± 7.7 kg [mean ± SD]) or passive stretching (PASS) (n=9; 20.7 ± 2.3 yrs; 1.78 ± 0.06 m; 71.0 ± 7.5 kg). The contralateral limb and a prior 'no exercise' condition were used as controls.

### **Results**

The PNF and PASS modes of conditioning improved passive hip flexibility to a similar extent (mean 19.3% vs. baseline, intervention limb,  $p < 0.01$ ) but did not alter knee flexor strength (overall mean 309.6 ± 81 N) or sensorimotor performance (force and positional errors: 2.3 ± 8.2 % and 0.48 ± 7.1 %). Voluntary and magnetically-evoked electromechanical delays (EMDV and EMDE, respectively) were impaired but to a greater extent following PASS compared to PNF (PASS: 10.8% and 16.9% lengthening of EMDV and EMDE, respectively vs. PNF: 3.2% and 6.2%,  $p < 0.01$ ).

### **Discussion**

The attenuated impairment to neuromuscular performance following PNF and its equivalent efficacy in flexibility conditioning would suggest that this mode of flexibility training should be used over passive to help preserve dynamic joint stability capabilities at this extended and vulnerable joint position.

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## **The Influence of Injuries Sustained Prior and During a Cricket Season on Lumbar Movement Control, Static and Dynamic Balance Ability in Cricket Fast Bowlers**

**Objectives:** This study aimed to test whether lumbar movement control, static and dynamic balance changed throughout a cricket season and whether any changes were related to reported injuries sustained by cricket fast bowlers prior to or during a cricket season.

**Design:** This was a quantitative, prospective, descriptive, longitudinal study.

**Setting:** Testing was done at indoor cricket nets before the start and at the end of a cricket season.

**Participants:** Thirty two, healthy, injury free premier league cricket fast bowlers between the ages of 18 and 26 years participated in this study.

**Main Outcome Measures:** Injury incidence, lumbar movement control, static and dynamic balance ability.

**Results:** Fifty three percent of bowlers (n=17) sustained one or more injuries during the reviewed cricket season. Performance in the star excursion balance-, one leg standing-, bent knee fall-out- and knee-lift abdominal tests showed significant improvement at the start compared to at the end of the cricket season ( $p < 0.05$ ). Being a medium pace bowler, past injuries sustained, an increased number of anatomical areas injured in the past, injuries sustained during the bowling action, increased bowling experience and low back injury sustained was significantly associated with the ability to perform movement control and balance tests.

**Conclusions:** Lumbar movement control and balance ability improved over the cricket season in a manner related to several intrinsic, physical factors. Since the inability to perform well in these tests were related to injury, it is possible that by addressing the intrinsic, physical factors associated with the ability to perform such tests, injury could be prevented.

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## **Pattern of Gait Analysis in Women -Case Study**

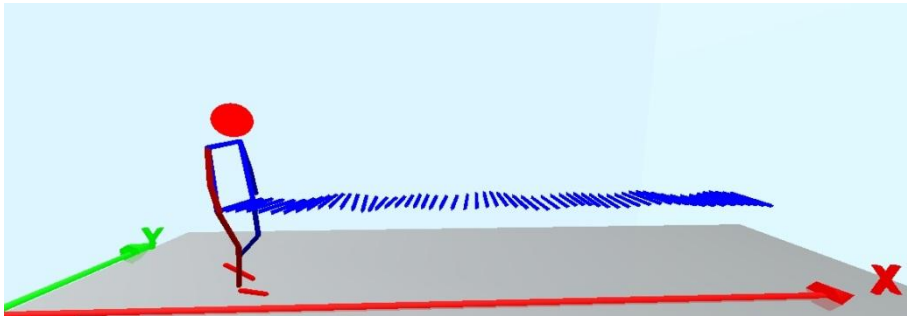
**Introduction:** Human gait is the way of locomotion which is characterized by differences in body movement patterns (especially limbs), overall velocity, velocities of body segments, overall acceleration, acceleration of body segments, forces, kinetic and potential energy cycles, and changes in the contact with the surface. Our study deals with 3D kinematic analysis of human gait which is based on case study of women walking.

**Aim:** The purpose of this research was using 3D kinematic analysis and obtaining very precise kinematic characteristics in chosen key phases of human gait.

**Methods:** Adult healthy woman in age of 45 years was videotaped by 2 synchronised high speed cameras and analysed by biomechanists. Step frequency was set by pace maker (frequency 2Hz), walking in amount of four steps was realised in laboratory conditions, on wooden ground and using sport shoes. With the help of 3D kinematic analysis and Simi motion software seventeen body segments were recorded (head, left shoulder, right shoulder, left elbow, right elbow, left wrist, right wrist, left hip, right hip, left knee, right knee, left ankle, right ankle, left forefoot, right forefoot, left heel, right heel). We focused on 5 key time moments during tested walking: step time, swing time, stance time, single support time, double support time and 3 length parameters: step length, stride length, support base. Specially we were interested in center of gravity movement. For all body segments some other characteristics like velocity, acceleration and angles were fulfilled. Based on mentioned above, expert evaluation of tested gait is available.

**Results:** There are gender differences in human gait: females walk with lesser step width and more pelvic movement. Gait analysis

generally takes gender into consideration. Females walking with hip sway, and males walking with swagger in shoulder generally have more physical attractiveness. All outputs are in numerical and graphical forms. Trajectory of hips axis (side view) is showed in picture 1.



Movement of hips has personal variability in range 77 - 91 degrees and plus 12 and minus 12 degrees at side and top views. Height of head moved from 1,510 to 1,556m (dif 0,046m) and center of gravity had differences from 0,884m to 0,922m (dif 0,038m). Many outputs of velocity (from 1,23 to 1,63m/s) and acceleration (from -2,66 to +2,52m/s<sup>2</sup>) parameters were achieved. All these results and their quality were confirmed by experts as well.

**Conclusions:** Human gait analysis can be done very precisely and sufficiently by using 3D kinematic analysis. This study brings also specific characteristics of woman walking (gait type and gait abnormalities) which support subjective expert evaluations of healthy walking.



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&

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## **Recovery Ratio from Autonomic Orienting Response as Predictor of High Performance in Cricket**

Twenty-three world-class cricket players of Bangladesh, selected for the ICC World Cup 2011, were compared with twenty-two amateur-competitive and eighteen developmental level cricketers of South-Asian contingent, on the basis of their consistent high performance and on the basis of their performance on psychomotor and psychobiological parameters, volunteered in this study. Orienting reflex measures of skin conductance as well as cardiovascular activity were done while the cricketers were engaged in psychomotor performances. Whole body reaction ability and anticipation simulated with close-fielding performance in cricket were evaluated as measure of agility and anticipation, along with the evaluations of signal detection type of perceptual discrimination ability (as measure of cognitive competence). Structural equations were done to identify the path regression related to performance excellence, which were suggestive of incoherence between the predictors. Short-term intensive action-regulation training was introduced, which could in turn modify intrinsic psychobiological mechanism leading towards excellence in performance in the elite-level cricket players. Multiple linear and polynomial regression analyses along with the predictive structural analyses were done to identify relationships between the psychobiological processes explained by the HPA axis and the TCA pathways, in relation to the cognitive-affective and affective-motivational aspects of sports behaviour, revealed by the projective analyses of emotionality. These models were aptly able to explain the efficacy of the action-regulation intervention techniques, in inducing the cognitive and emotional flexibility required for performance excellence in elite-level cricket events.

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**Impact of Accuracy in Anticipation on  
Decomposition of Autonomic Tonic and Phasic  
Responses as Predictor of Performance Excellence in  
Malaysian Swimmer**

Present study was aimed at identification of intricate relationship between the ability of the high performing swimmers (National - level swimmers of Malaysia) in anticipatory cue-utilization and corresponding autonomic phasic responses isolated from the tonic measures. Altogether two-hundred and twenty-five individuals having high athletic calibre, and holding top-positions in recently held National and International (Mostly ASEAN level) meets volunteered as the participants in this study. Simultaneous evaluation of autonomic arousal modulation (habituation paradigm tonic and phasic measures of skin conductance) was done when the swimmers were engaged in cue-related anticipatory task, associated with complex reaction performance. For this purpose, participants were evaluated intermittently (twice within the calendar year August 2010 - July 2011) with the identical research paradigm. Perceived sense of competence as well as the subjective feelings of apprehension of loosing was explored, and attempts were made to identify the obscure subjective expression of cognitive-emotional make-up, in explaining differential performance outcomes evident in the participants. Findings of multiple linear and polynomial regression analyses and predictive structural analyses however suggested direct, inverse and supportive relationships between measures of physiological arousal and psychological phenomena related to cognitive-affective and affective-motivational aspects of sports behaviour explaining pathways to both excellent and debilitating performance outcomes during practice sessions as well as in actual competitive situations.

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## **Physical Activity as a Sociological Phenomenon**

We are living a time when society, culture and science have become increasingly aware of the great importance of sport not only as a part of mass culture, but broadly understood, for individual and social health and well-being. Physical activity of people plays increasingly more important role in scientific interest regarding way of life of contemporary society and it is very crucial factor in the process of officiating of the level of healthy and active life style, quality of life and health in general. Indispensable role of physical activity in the course of human life is permanently scientifically confirmed also in context of prevention of obesity.

The development of a sedentary life style is the result of a socialization process towards physical inactivity developed in youth and continued into adulthood. At the present we face in our cultural settings apparent tendency: People are more and more individualized, loosing beneficial impacts of community activities, involved in passive way of life lacking proper level of physical activities and active sport. The phenomenon of physical activity has been considered also from the perspective of the Project EURO-PREVOB accenting built environmental aspects of way of life.

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## **The Effect Of The Elvs (Experimental Law Variations) on the Super 14 Rugby Union Tournaments**

The aim of this study was to determine whether the experimental law variations (ELV) succeeded in changing the flow of rugby union matches to make it more appealing to spectators. All the teams of the 2006 and 2008 Super 14 rugby tournament were used in this study. Three hundred and seventy games were recorded on video and analysed by means of the Opta Sports Data software package (Opta Sportsdata Limited, Harrogate, United Kingdom, 2005). The frequency of the following performance indicators were used to address the aim in this study: Scrums, tackles, line-outs, meters gained, passes made, penalties conceded, tries scored, rucks formed and defense beaten. The frequency of performance indicators from the various seasons was compared. The results obtained were then used in mathematical calculations to determine the practical significance with the use of Cohan's effect sizes. The number of scrums and line-outs decreased with a large practical significant value ( $d \geq 0.8$ ). In contrast to this, the number of tackles made, meters gained and penalties conceded all increased with a large practical significant value over the two seasons. A medium effect size value was found for frequency of rucks, beat defense and passes made. The increase in action activities and decrease in static activities suggest that the IRB have succeeded in addressing their objective of increasing the appeal of the game with the introduction of the ELVs.

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## **Relationship between Foot Grip Force and Leg Muscle Force Generating Capacity in Middle-Aged and Elderly Individuals**

### **Introduction**

Many physical activities are performed with a standing position on the foot and foot bears body weight as it carry the body through daily or sports activities. There are numerous studies on muscle functions of lower limbs; however, only few studies have demonstrated how foot grip force is associated with the force generating capacity of leg. Therefore, the present study was to investigate how isometric foot grip force generation was related to the force generating capacity of leg in middle aged and elderly individuals.

### **Methods**

Thirty-one healthy individuals (63+/-9 years old) were measured the maximum foot grip, knee extension and leg extension forces. For MVC measurement of foot grip force, subjects exerted maximum force for ~3 seconds on a foot grip dynamometer with either sitting or standing position. Subjects also performed the maximum isometric knee extension and leg extension forces. Measurements were repeated three times with at least one-minute rest period between bouts, and the highest value among the measurements was used.

### **Results and Discussion**

Foot grip forces both at the sitting and standing position were positively correlated with both the maximum isometric knee extension and leg extension forces, respectively. Foot grip force at the standing position was a higher correlation with the force generating capacity of leg as compared with foot grip force at the sitting position. The present results indicate that the ability to generate higher foot grip force is associated with a strong leg muscle force. Also, the measurement of foot grip force at standing position is more useful when evaluating the lower limb muscle functions with other leg force measurements.