

UNIVERSITY OF  
PHYSICAL EDUCATION

23<sup>RD</sup> INTERNATIONAL  
STUDENT CONGRESS  
ON SPORT SCIENCES  
(ISCSS)

April 27, 2018





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# FOREWORD

Dear Students, Mentors and Colleagues!

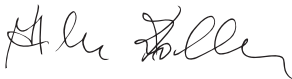
On behalf of the University of Physical Education, Budapest, Hungary, it is my great pleasure to welcome you to the 23<sup>rd</sup> International Student Congress on Sport Sciences (ISCSS) in Budapest on April 27, 2018.

The Congress is held in the campus of the University, which is located close to the river Danube, the main historical area and other attractions of the beautiful city of Budapest.

It is a long-lasting tradition of our University to bring young research-oriented people from Hungary and other countries together to present topics from all discipline in Sport Science.

The ISCSS provides a valuable opportunity for the exchange of research findings, ideas and concepts, through oral presentations. And it is also our hope that the discussions will lead to successful research collaborations and future projects among the participants. If you have never attended or presented at our congress, you can hardly imagine the international spirit and vitality of this event, especially that Erasmus' students from all over the world also participate. The plenary speakers are internationally known experts of their research fields and focus on different topics in order to show valuable examples of research in several areas of sport sciences. The Program Committee prepared an exciting program and the excellent student speakers will provide a unique contribution to the participants of the Congress. For the best abstracts/speakers Awards will be given.

Come and join us at the 23<sup>rd</sup> ISCSS and become part of an international student-scientist experience. Welcome to the University of Physical Education, welcome to Budapest!



Prof. Akos Koller  
President  
Student's Scientific Association

## Organizing Committee

- Akos Koller, Scientific Council Chair, president of Student's Scientific Association
- Martina Uvacsek, associate professor, representative of the Institute of Natural Sciences
- Gabriella Tzarkoma-Bicsérdy, research fellow, representative of the Institute of Sports
- Zoltán Bábosik, associate professor, representative of the Institute of Physical Education Teacher
- Bálint Dolnegó, assistant lecturer, representative of the Institute of Economics and Social Sciences
- Lajos Morvai, president of the Student's Council (HÖK)
- Sabina D'Ess, member of the Student's Council (HÖK)
- Máté Nagy, PhD student
- Levente Tóth, secretary of chancellor
- Judit Farkas, council administrator, Public Relations Directorate
- András Király, design, editing

## Official Language

English. No simultaneous translation will be provided.

## Certificate Of Attendance

A Certificate of Attendance will be issued during the Congress. No certificate will be issued after the Conference.

## Information

At the registration desk staff members will be glad to help you with any enquiries.

## Lunches

Lunch tickets will be provided for registered speakers and supervisors.

## Mobile Phones

Mobile phones should be switched off during the Scientific Sessions.

## Guidelines for speakers

1. Please locate your session room in due time and be there at least 20 minutes before the start of the session and give the presentation to the technician on a pendrive.
2. Presentation format: Microsoft PowerPoint, Windows Version 8 Electronic Support: USB only.
3. Videos should be included in your PowerPoint. Presentation should be in a format that is supported by Windows Media Player.
4. We would like to ask the speakers to keep their presentations within the given time limits for the sake of the next speakers.
5. In case of using your own laptop, please inform the technician in the Session / Lecture Room, in due time to get prepare for it.

## Sections and Committees

- Section 1: Research on Sports Management - Dr. habil Gábor Géczi (Chair), Dr. Csaba Bartha, Dr. Zsuzsanna Kalmár
- Section 2: Biomechanics and Health Science in Sport - Dr. Lukas Tzarkoma (Chair), Dr. Martina Uvacsek, Dr. Sándor Sáfár
- Section 3: Social Science and Sports - Prof. Dr. Jerzy Kosiewicz (Chair), Dr. Katalin Kovács, Dr. Gabriella Tzarkoma-Bicsérdy
- Section 4: Physiology in Sport Science - Prof. Dr. Karsten Froberg (Chair), Dr. Anna Farkas, Dr. Erika Koltai

# PROGRAM

- 8:00-8:30 Registration, Welcome coffee (uploading the presentations)
- 8:30-8:40 Opening Ceremony (Hepp Ferenc Room)  
Prof. Dr. h. c. Lajos Mocsai, Rector  
Prof. Dr. Ákos Koller
- 8:40-9:30 Invited Speakers (Hepp Ferenc Room)  
Chair: Prof. Dr. Ákos Koller
- 8:40-9:05 Dr. Karsten Froberg, University of Southern Denmark, Odense, Denmark: The importance of physical activity in children and young people
- 9:05-9:30 Prof. Ines Drenjancevic, Faculty of Medicine, Josip Juraj Strossmayer University of Osijek, Croatia: The effect of n-3 PUFA supplementation on physical performance and microvascular function
- 9:30-11:00 Students' Sections  
Section 1: Research on Sports Management (Hepp Ferenc Room)  
Section 2: Biomechanics and Health Science in Sport (1st floor Room 37)
- 11:00-11:20 Coffee Break
- 11:20-12:50 Students' Sections  
Section 3: Social Science and Sports (Hepp Ferenc Room)  
Section 4: Physiology in Sport Science (1st floor Room 37)
- 13:00-14:00 Lunch
- 14:00-14:45 Closing Ceremony, Awards (Hepp Ferenc Room)  
Prof. dr. h.c Lajos Mocsai, Prof. Ákos Koller, Dr. habil Gábor Géczi, Dr. Lukás Tzarkoma, Prof. Dr. Jerzy Kosiewicz, Prof. Dr. Karsten Froberg



# SECTIONS AND PRESENTATIONS

## Section 1: Research on Sports Management

Committee: Dr. habil Gábor Gécsi (Chair), Dr. Csaba Bartha, Dr. Zsuzsanna Kalmár

1. **Anna Lenkei** (supervisor: Dr. Szilvia Perényi): Minimalism – Less is More
2. **Viktor Berezvai** (Supervisor: Dr. Péter Farkas): Correlation analysis of students with special educational needs and disabilities (SEND) in European countries
3. **Timea Szabó** (Supervisor: Dr. Judit Farkas): Volunteering abroad and its possible positive effects in Hungary
4. **Niels de Frag** (supervisor: Dr. Nikoletta Onyestyak): The crucial role of sport for development and peace for the social inclusion of refugees in Europe
5. **Kristóf Világi** (supervisor: Dr. Tamás Sterbenz): SAUS Hungary - Mapping the Hungarian sport analytics and sport IT level, creating a development plan to apply sport analytics
6. **Roland Kiss** (supervisor: Dr. Judit Farkas): The examination of the role of acquiring informal knowledge about the competition organizing activities and duties of sports experts
7. **Brigitta Cseh** (supervisor: Lili Kassay): Hungarian and foreign participants to the extreme obstacle running race with dogs, Hard Dog Race

## Section 2: Biomechanics and Health Science in Sport

Committee: Dr. Lukas Tzarkoma (Chair), Dr. Martina Uvacksek, Dr. Sándor Sáfár

1. **Ádám Fazekas, Kozsdi Anna** (supervisor: Dr. Piroška Ágnes Szalay): Testing a complex health promotion at work and the results
2. **Dániel Csala, Bálint Kovács** (supervisor: Dr. József Tihanyi): Impact of hip extension and tibial rotation on regional hamstrings activity – implications for EMG normalization
3. **Chang Yin** (supervisor: Prof. Ákos Koller): A case report of the usefulness of conservative therapies of herniated intervertebral disc (HIVD) in a male gymnast
4. **Luka Kolar, Stupin Marko, Stupin Ana** (supervisor: Ines Drenjančević): What can we do to prevent athlete's sudden death?
5. **Christian Wester** (supervisor: Anders Grøntved): Development and Validation of a Questionnaire to Assess Leisure Time Screen-based Media Use in Children
6. **Virág Kis** (supervisor: Dr. Bence László Raposa): Examination of athletes' eating habits in various ice skating sports, disciplines

7. **Bence Simon, Eszter Tóth** (supervisor: Kornélia Orbán, Andor H. Molnár): Risk factors of the female athlete triad among Hungarian water polo players

### Section 3: Social Science and Sports

Committee: Prof. Dr. Jerzy Kosiewicz (Chair), Dr. Katalin Kovács, Dr. Gabriella Tzras-koma-Bicsérdy

1. **Vivien Eszter Taylor, Veronika Kiss** (supervisor: Dr. Ottó Benczenleitner, László Tóth, Dániel Mezei): Attitudes towards doping – a comparison of athletes, non-athletes, and sport experts
2. **Madelena Krawiec** (supervisor: Anna Kuk, Lilla Török): Occupational burnout among physical education teachers in Warsaw and Athens
3. **Gábor Almási** (supervisor: Dr. Anna Farkas, Dr. Márta Szmodis): Coach preferences in Hungarian water sports
4. **Balázs Garai** (supervisor: Bálint Dolnegó): Research on Rule of The Game Knowledge of Hungarian Handball Referees
5. **Botond Ágoston Nagy, Ágost Benedek Nagy** (supervisor: Judit Balogh): A possible investigational method of the improvement of the performance in the youth basketball program, with the simultaneous use of a complex conditional and special shooting programs
6. **Bence Kelemen** (supervisor: Dr. Zsolt Gyimes): The comparison of male 1500m elite runners' winning and record tactics
7. **Viktória Horváth** (supervisor: Dr. György Bárdos): Health promotion program for university students
8. **Zita Domonkos** (Supervisor: Prof. Ferenc Ihász): Psychometric characteristics of body imaging in consideration of satisfaction and self-esteem

### Section 4: Physiology in Sport Science

Committee: Prof. Dr. Karsten Froberg (Chair), Dr. Anna Farkas, Dr. Erika Koltai

1. **Márk Kántor** (supervisor: Dr. Ákos Koller, Dr. Ádám Lelbach): Regular physical activity as a prevention of cardiovascular diseases
2. **Bálint Flanek, Bettina Albert** (supervisor: Dr. Ákos Koller, Dr. Ádám Lelbach): Cardiovascular protection through regular physical activity - clinical translation of international research results

3. **Erna Davidovics Cvetko** (supervisor: Prof. Ines Drenjančević): Effects of eight-week intensive aerobic exercise on bone metabolism and body composition in college students
4. **Sándor Gergely Gabnai, Lili Kósa** (supervisor: Prof. Ferenc Ihász): Longitudinal study of cardiorespiratory parameters of elite female handball players
5. **Eliza Eszter Tóth** (supervisor: Prof. Ferenc Ihász): Examination of Cardiorespiratory and Metabolic Responses in endurance athletes and members of Counter Terrorism Centre
6. **Péter Bakonyi** (supervisor: Prof. Dr. Zsolt Radák): The effects of blood flow restriction training on the genetic markers of thigh extensor muscle
7. **Lili Kósa** (supervisor: Prof. Ferenc Ihász): Development of cardiovascular system among kayak-canoe riders with continuous pulse control

# ABSTRACTS

## INVITED SPEAKERS

### **Karsten Froberg**

Associate Professor, Dr., FECCS

Centre of Research in Childhood Health, Department of Sports Science and Clinical Biomechanics, University of Southern Denmark, Odense, Denmark

### The importance of physical activity in children and young people

A physically active lifestyle has direct and indirect health benefits for young people, particularly through the possible prevention of overweight and obesity, the promotion of good physical and mental health and the establishment of healthy lifestyles that may be continued into adulthood. Many young people do take part in regular physical activity and sport. However, there is increasing evidence to suggest that large numbers of young people across the European Union region are not taking part in physical activity to a level recommended to benefit their health.

The established causal links between health status and Cardio-Vascular-Disease (CVD) risk factors have not yet been confirmed in children, but behavioral, physiological and genetic risk factors for CVD can be identified in children and young people. Low physical activity (PA) and physical fitness (PF) has been independently linked to risk factors for CVD mortality in men and women, and furthermore related to CVD risk factors such as elevated blood pressure and unfavorable blood lipids at an early stage in children. It is biologically plausible that PA and PF independently improve the metabolic health profile. PA is an overarching term that consists of many structured and unstructured forms within school and out-of-school-time contexts, including organized sport, physical education, outdoor recreation, motor skill development programs, recess, and active transportation such as biking and walking. It has also been verified that both risk factors and sedentary behavior track during childhood and into adulthood. Therefore, there is a rationale for early prevention including PA in a broad perspective to improve physical fitness, physiological wellbeing, and cognitive function.

This presentation will deal with selected research projects behind the consensus statements of the above mentioned.

Ref.: Bangsbo J, Krstrup P, Duda J, Hillman C, Andersen LB, Weiss M, Williams CA, Lin-

tunen T, Green K, Hansen PR, Naylor PJ, Ericsson I, Nielsen G, Froberg K, Bugge A, Lundbye-Jensen J, Schipperijn J, Dagkas S, Agergaard S, von Seelen J, Østergaard C, Skovgaard T, Busch H, Elbe AM. The Copenhagen Consensus Conference 2016: children, youth, and physical activity in schools and during leisure time. *Br J Sports Med.* 50(19):1177-8; 2016

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## **Ines Drenjančević, MD, PhD**

Professor, Faculty of Medicine Osijek, Josip Juraj Strossmayer University of Osijek; Croatian National Scientific Center of Excellence for Personalized Health Care Josip Juraj Strossmayer University of Osijek, Croatia

### **The effect of n-3 PUFA supplementation on physical performance and microvascular function**

It is well accepted that for athletes, balanced nutrition, rich in proteins and carbohydrates is of utmost importance to achieve expected sports' results. In addition, the fast and full recovery of muscles and overall body status may also be influenced by diet. Recently, fat content as well as the fat composition came into the focus of interest in sport nutrition. Among them, particular interest has been evocated by polyunsaturated fatty acids (PUFAs) for their beneficiary effect on vascular health and potential to improve physical performance. For example, treatment with n-3 PUFAs enhances brachial artery blood flow and conductance during exercise and enhances microvascular postocclusive hyperemic response in healthy humans.

PUFAs n-3 supplementation may improve anaerobic endurance and may modulate oxygen consumption during intense exercise, due to incorporation in skeletal muscle membrane incorporation, may increase metabolic capacity, delaying the onset of fatigue, and improving muscle hypertrophy and neuromuscular function in humans. Animal studies demonstrated enhanced endurance capacity to exercise. In addition, n-3 PUFAs have anti-inflammatory and anti-nociceptive effects and may attenuate the delayed onset muscle soreness and muscle stiffness, and to preserve joint motions. On the other hand, some studies were not able to provide evidences of beneficiary effects of dietary PUFAs on skeletomuscular system in athletes. N-3 PUFAs' effects were variably observed in men and women and vary depending on dietary protocol, type of supplementation and type of undertaken sports activity. Randomized controlled clinical studies are necessary for better insight into PUFAs effects on vascular, and muscular function and endurance in athletes.

Keywords: n-3 PUFAs, microcirculation, muscular endurance, athletes, diet

## STUDENT SPEAKERS

### **Gábor Almási**

**University of Physical Education, Budapest, Hungary**

Supervisor: Dr. Farkas Anna, University of Physical Education, research fellow | Dr. Szmodis Márta, University of Physical Education, associate professor

### Coach preferences in Hungarian water sports

#### **Introduction:**

Sport selection, as being the base of the successful future sport career, depend on long term well-organized and planned training process. In the middle of the 19'-s, which was the golden age of Hungarian sport life, the coaches have numerus applicants to choose from, but this luxury is no longer available. This reason makes it necessary to find the talented athletes as soon as possible and applying the most sufficient training regarding their age. The purpose of our study was to analyse the Hungarian water sports (swimming, pentathlon, triathlon, water polo) coaches selecting aspects. It was supposed, that the more successful the sport event the more conscious the selection was.

#### **Methods:**

Hungarian coaches [ $\Sigma=56$  person, pentathlon  $N=5$  person, triathlon  $N=7$  person, swimming  $N=8$  person, water polo  $N=27$  person, swimming and pentathlon  $N=6$  person, swimming and water polo  $N=4$  person] mostly working with young athletes were asked by questionnaire about their preferences in the selection. Altogether 36 questions were asked in relation to the coaches' sport event, age-group they trained, the duration of the training session and about their main aspects of selection. We analysed the data with standard statistical procedures, which contained Student  $t$ -test,  $\text{Khi}^2$ -test ( $p \leq 0,05$ ) and descriptive statistics.

#### **Results:**

Comparing the coaches by sports, we discovered numerous, significant differences: the average age of starting regular training among water polo players was 8,79 years, while among the other, swimming performance based sports (swimming, pentathlon, triathlon), it was 7,1 years. The beginning of competing was also different: water polo players started at the age of 10,65, which matched the coaches' preference, while the others started at the age of 8,3, but the coaches would prefer a later age, 9,58. Comparing the selecting body parameters, we found that the water polo coaches keep the height more important than the pentathletes. The caches working in the country were younger and preferred earlier start for training and participating at competition, then those working in the capital. Younger coaches keep higher volume of shoulder width more important and they believe, that the

performance of accelerated athletes is sustainable. Half of the coaches had higher level degree. Only 41,1% thought, that their field contains conscious selection. 82,1% would use the help of other specialist, but most of them thinks that intuition and experience is the base of selection. 44,6% of the coaches thinks that the performance of accelerated athletes is sustainable, but only 25% would chose them instead of others.

### **Conclusion:**

Most of the coaches still recline on experience and intuition rather than scientific results in the process of selection. We think, that the differences in comparing the coaches by age is caused by the necessity of achieving medals, because the coaches work efficiency is measured by that, although they realise, that this system is not ideal for young athletes. Scientifically grounded selecting methods should be getting more weight in the coaches' education, which could lead to a more successful, conscious section.

**Keywords:** water sports, selection, coach preference

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## **Péter Bakonyi**

**University of Physical Education, Budapest, Hungary, Budapest**

Supervisor: Prof. Dr. Radák Zsolt, Head of department, Research Institute of Sport and Life Sciences

## The effects of blood flow restriction training on the genetic markers of high extensor muscle

### **Introduction:**

The blood flow restriction (BFR) training is a current method with a primal use as a recreational or rehabilitation tool. The blood flow restriction training decreases the venous backflow, and by that the blood supply under the occluded area. The working muscles hypoxic status is increasing and the vascular endothelium is exposed to elevated shear force during BFR. The previously documented hypertrophic effects of the occlusion training hypothesize a plausible preconditioning effect with direct or indirect impacts on the metabolism of the musculoskeletal system. Nevertheless the exact transcription changes are not well characterised yet.

### **Purpose of study:**

With a new training method we aimed to demonstrate how the BFR during the resting periods affects the traditional weight training at functional as well as the transcriptional

level. Our approach is to develop a protocol that improves power and endurance in a complex manner.

**Methods:**

During the low intensity BFR training (with 30% of the one repetitions maximum) the working limb is exposed to venous occlusion during the whole training time. In our study we applied the occlusion only for one minute in each resting period between squatting sets. The intensity of the training was specified as the 1RM 70%.

Our research contained an acute exercise protocol. In our acute training measurement 7 young adult men performed 7x10 repetitions. The right leg was exposed to 1 minute of occlusions during the 2 minute resting period (~200Hgmm). 2 hours after the training a bilateral microbiopsy sample were taken and the most important genes expression involved in skeletal muscle metabolism measured with polymerase chain reactions method.

Before the exercise protocol we measured the 3RM, which data helped us to calculate the 70% intensity of individual participants, used as training load.

**Results:**

According to our results the BFR is not only affects the markers of protein synthesis, but also the genes which can be associated with muscle vascularization, and oxidative metabolism. The most interesting result was the elevated transcription of the Paired box protein 7 gene.

**Conclusions:**

It can be concluded, that beyond the induction of protein synthesis-, and vascularisation markers, BRF training has the capacity to up regulate the satellite cell activation mechanisms.

**Keywords:** BFR – Blood Flow Restriction, Occlusion training, PAX7

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**Viktor Berezvai**

**University of Physical Education, Budapest, Hungary**

Supervisor: Dr. Péter Farkas Department of Social Sciences, University of Physical Education (TF), Budapest

**Correlation analysis of students with special educational needs and disabilities (SEND) in European countries**

**Introduction:**

Statistically, each class of 20 students in the European Union has someone with Special



Educational Needs (SEN). That means they need additional attention and care, otherwise they are likely to drop out or suffer discrimination. People with SEND are more often unemployed or work for a lower salary (S. Riddel et al., 2012). In my own class there were a couple of students with Learning Disorders (LD), ADHD and Social Disorders, so I decided to research this topic to better understand their deviant behaviour. Sports can be a solution for inclusion, but it will not help in all cases.

### **Purpose of study:**

The main goal is to find what factors correlate with **SEN** and reveal possible **causes**. So far it has been proven that lower birthweight and gestational age (pregnancy in weeks) can be responsible for 28% of SEN (DF Mackay et al., 2012). Following this research line, I test various statistics with correlation analysis to find further causes of SEN among children.

### **Hypothesis:**

(1) The more sports a country does, the lower the students with SEN. (2) Increased teacher salary come with lower SEN numbers. (3) Alcohol consumption in a country raises the number of students with SEN.

### **Methods:**

With the use of the software *Statistica 10* (Statsoft, 2011) I compared a variety of statistics with each country's SEN percentage to find out how strong the correlations are. For my database, I used trusted sources like WHO, Eurostat and Eurobarometer to analyse the data of 27 countries. So far, I worked with the amount of Sports people do, GDP, Purchasing Power Standard (PPS), Alcohol consumption, Teacher's average salary, and Level of stress.

### **Results:**

Regarding sports and physical activity, there was a 16% correlation, showing that a country with higher SEN percentage seemed to do more sports. With the statistics of 'not doing any physical activity at all', there was no significant correlation (only 2%). The GDP Per Capita showed **30% negative correlation, so lower GDP came with higher SEN**. The PPS gives only negative 6%. The 'GDP spent on education' showed 13%, meaning the more we spent on education the higher statistics we got for SEN. That seems like a paradox but has a possible explanation; with improved education, teachers tend to care more for children, so they have more capacity to diagnose each student, leading to a higher SEN. Furthermore, with a tendency of 23%, the more salary teachers got the less number of students with SEN in 24 countries. The correlation of alcohol consumption was above 11%, meaning that higher alcohol consumption resulted in more students with SEN.

### **Conclusions:**

Regarding physical activity, there was no significant correlation with SEN, although the

second hypothesis about the salary of teachers shows a weak, but positive tendency. A stronger financial support for the teachers might reduce the number of students with SEN. References: (1) Sheila Riddell et al. (2012): Education and disability/special needs, European Union (2) DF Mackay et al. (2012): Obstetric factors and different causes of special educational need: retrospective cohort study of 407 503 school children. BJOG.

**Keywords:** Special Educational Needs (SEN), Causes of SEN, Sports, European countries

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## **Dániel Csala, Bálint Kovács**

**University of Physical Education, Budapest, Hungary**

Supervisor: Dr Tihanyi József, professor emeritus, University of Physical Education

### **Impact of hip extension and tibial rotation on regional hamstrings activity – implications for EMG normalisation**

#### **Introduction:**

Maximal voluntary isometric contractions (MVICs) are widely used to normalise muscle electromyography (EMG) activity. Hamstring activity has previously been normalised to maximal voluntary isometric knee flexion. However, bi-articular hamstrings also contribute to hip extension and tibial rotation, so it is unclear whether knee flexion alone is sufficient to evoke maximal voluntary hamstring activity. The aim of this study was to examine the effects of different MVIC tasks on the regional activity of semitendinosus (ST) and biceps femoris long head (BFlh) using high-density EMG (HD-EMG).

#### **Methods:**

Seventeen young males participated in a familiarisation and two measurement sessions (A and B). In session A, participants performed knee flexion (KF) MVICs, as well as internal (KFI) and external (KFE) tibial rotation each superimposed on KF. In session B, KF was followed by hip extension superimposed on knee flexion (HK), and HK with internal (HKI) and external rotation (HKE). After MVICs, bent-knee bridge exercise was performed. ST and BFlh activities were recorded with HD-EMG covering 16cm of each muscle. ST and BFlh bent-knee bridge activity were normalised to each MVIC task. Activity level was calculated for each muscle (overall activity), as well as for distal, middle and proximal regions. Differences were expressed in Cohen's  $d \pm 90\%$  confidence intervals. Between-session reliability (ICC) of bent-knee bridge activity normalised to KF was calculated.

### **Results:**

For ST, knee flexion showed the lowest normalised activity in all muscle regions ( $d=0.10-0.46$  compared to other tasks) however in the middle and proximal BFlh HK normalisation resulted in lower activity compared to normalising to KF ( $d$  range =  $0.33-0.39$ ). KFI and KFE altered ST and BFlh relative activity, but normalised activity was similar or lower in KF in both muscles ( $d$  range =  $0.00-0.34$ ). Reliability was high for both BFlh and ST overall activity (ICC= $0.94$  and  $0.86$ , respectively) as well as for each BFlh regions (ICC= $0.85-0.94$ ), while moderate for ST regions (ICC= $0.55-0.75$ ).

### **Discussion:**

Knee flexion task seems optimal for ST normalisation. In BFlh, hip extension superimposed on knee flexion enables more effective excitation, especially in the middle and proximal regions. The use of the same knee flexion task to normalise both ST and BFlh EMG activity hampers interpretation of the relative activity of these muscles, which is vital from an injury prevention perspective. On the other hand HD-EMG is a reliable method to estimate BFlh and ST overall EMG activity. Lower reliability of ST regions compared to its overall activity highlights the need for spatially robust approach to estimate ST activity.

**Keywords:** hamstring, regional activity, normalisation

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## **Brigitta Cseh**

**University of Physical Education, Budapest; Corvinus University of Budapest, MSC in Sport Management, Hungary**

Supervisor: Lili Kassay, senior lecturer, Sport Management Department, University of Physical Education, Budapest

## **Hungarian and foreign participants to the extreme obstacle running race with dogs, Hard Dog Race**

Movement recreation in nowadays fast-paced world is a very important element of useful spare time spending. One of its specializations is the adventure seeking recreation which came into existence to compensate both the monotony of the work and the pressure to perform of the individual by searching the leisure in nature. From this lack was formed the extreme recreational sporting and to which the Obstacle Course Racing (OCR- extreme obstacle running race) competitions are strongly connected. As a branch of the OCR competitions in 2016 the Hard Dog Race was founded, where the competitor does not have to fight the nature and the obstacles on the field alone, but with its dog, its partner. The Hard

Dog Race is unique because there is no other OCR branch where the race is happening with a dog and the owner-dog couple can only lean on each other during the competition. Purpose of the research is to present that the OCR competitions and the Hard Dog Race in particular enjoys widespread popularity among the respondents. Relationship of the competitors and its dogs during the race and in the spirit of mutual cooperation does become positive and evolves, this way they can form a good team inside and out of the race. Another aim is to present that the most of the respondents leads a rather sporty lifestyle, and that they have already attended more similar races with or without dogs as well.

Hypothesis:

1. Based on the answers of the Hard Dog Race competitors I assume that moving with the dog motivates one to a more athletic lifestyle and that it improves the owner-dog relationship as well.
2. I also presume that more than 50 % of the ones accomplished the Hard Dog Race have already been attending similar OCR races with or without dog.

During the research the questionnaire method was selected because in this manner more competitors could be reached and questioned, this way the pool of research could be widened. Since Hard Dog Race has been accomplished by not only Hungarian, but competitors of many other countries as well, I assured the opportunity to fill the questionnaires in Hungarian and English. Based on the preliminary examination of the questionnaire one could assess that the bigger part of the respondents were leading a more athletic lifestyle and does daily or more times a week some kind of sport activity, and also that their motivation to accomplish Hard Dog Race is greater, in order to enhance happiness for the dog and one's self. It could be observed that the majority of the respondents were motivated more by the fact that they could do sport with their dogs together, this way the sport having an important role in their life. At a large percent of the respondents it could be noticed that Hard Dog Race have not been their first race, they have accomplished many similar OCR competitions or other dog races with success.

**Keywords:** Extreme obstacle running race, Hard Dog Race, Extreme leisure sporting, Dog-Owner relationship, Running with dog

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**Erna Davidović Cvetko**

**College of Applied Sciences L. Ružička in Vukovar, Vukovar, Croatia**

Supervisor: Prof. Ines Drenjančević, PhD

Effects of eight-week intensive aerobic exercise on bone metabolism and body composition in college students

### **Introduction:**

Although recommendation for bone health and prevention of osteoporosis usually includes strength exercise, there is evidence that aerobic exercise can also prevent bone loss.

### **Purpose of the study:**

Main goals of this study were: to explore 1) if there is effect of specific interval aerobic exercise protocol to bone remodeling process, and 2) if there is connection of bone remodeling to body composition, and if changes in bone remodeling will be in correlation to changes in body composition induced by examined training protocol. Third goal was to determine if examined training would produce different results for sexes.

### **Methods:**

Twenty-one students (11 males and 10 females) aged 20-23 years performed aerobic exercise with different intensity during eight weeks. Bone density and bone mineral content (by DXA), and concentration of markers of bone metabolism were measured at the start and at the end of the study. Changes in body composition were tracked during the study.

### **Results:**

Results showed that examined aerobic exercise protocol was stimulating for bone turnover, because it induced changes in concentration of markers of bone turnover. Body composition had not significantly change during the study, except for the mass of body fat, which followed the change in the exercise intensity. Bone density and bone mineral content were in positive correlation to the lean body mass. Change of the lean body mass after eight weeks of exercise was in positive correlation to change in bone density in dual femur site in males.

### **Conclusions:**

implemented aerobic exercise protocol was stimulating for bone remodeling process. This exercise protocol did not affect lean body mass, but it influenced body mass of fat. There is positive correlation between lean body mass and bone density. However, there is need for further investigation on effects of different durations and different intensities of aerobic exercise on bones and body composition to produce some knowledge on how to improve health in general and reduce risks on conditions like osteoporosis.

**Keywords:** aerobic exercise, bone metabolism, bone density, body composition

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**Niels de Fraguier**

**University of Physical Education, Budapest, Hungary**

Supervisor: Dr. Nikoletta Onyestyak

## The crucial role of Sport for Development and Peace for the social inclusion of Refugees in Europe

### **Introduction**

During the year of 2015, 1.015.078 refugees arrived officially into the European Union (UNHCR). One of the opportunities addressed to refugees to maintain their education, well-being and help them to develop social skills are the sport-based programs. The refugees living in camps and structures were involved in these programs developed under different forms to ensure their personal and social development.

### **Purpose of the study**

The field of social development and peace (SDP) is now recognized but their adaptations to the specific needs of the refugees have to be done with a common agreement in order to ensure positiveness and sustainability. This research will highlight the achievements, the issues and ameliorations needed for the next years throughout an analysis of the current situation.

### **Methods**

This study is using qualitative research methods mainly with in-depth interviews with national authorities', NGOs' and stakeholders' representatives as well as refugees. An important part of the research has been done in Greece during the month of January 2018 within a daily involvement in the field with refugees with the NGO Solidarity Now. This experience ensured a good comprehension of the main issues and the reality of the field within activities and involvement with refugees.

### **Results**

Sport is really appreciated by the European institutions as well as the governments to promote values and ensure the social inclusion of all. This trend is helpful to increase the budget quality of the European Union initiatives with the funding of different long term projects. In 2016, 11 projects get selected out of 56 by the European Commission to encourage the inclusion of Refugees in Europe through sport activities.

Despite this evolution, the results in sport for social inclusion are difficult to measure and, de facto, difficult to plan for long-term projects. The sport for social development sector needs a new framework to achieve its goals and reach the sustainable development goals of the agenda 2030.

### **Conclusions**

The achievements related to sport-based programs for refugees highlight the importance of sport in the field of social development but also underline the lack of a regulate global framework bound for refugees. The field of social development and peace (SDP) is now recognized but the adaptation to the specific needs of the refugees have to be done with a common agreement in order to ensure positiveness and sustainability.

## **Ádám Fazekas, Anna Kozsdi**

**University of Physical Education, Budapest, Hungary**

Supervisor: Dr. Szalay Piroska Ágnes, associate professor

### Testing a complex health promotion at work and the results

#### **Introduction**

In Hungary, workers spend an average of 40,6 hours/week at their workplaces, so health protection in this area defines their health in a high range. According to the law of Labour Safety from 1993, every employer has to take care of the moderation of particularly the monotonic work's time and the reduction of its harmful effects while forming the workplace, choosing the working time, work equipments and work process. The companies' task is to defend their employees' state of health with the help of different health promotion services (HPS), such as ergonomic measurements, movement function examinations, dietetic guidance, screening tests, sport days. The HPS can be very different and useful, but unfortunately in Hungary the use of it isn't as common as it is in Western European countries. The reason for this bad decision is that they don't recognize the long term economic advantages.

#### **Our research**

So the goal of our research was to search for HPS possibilities in Hungary, furthermore to measure the effectiveness and the workers' feelings about its usefulness, and also to find out what kind of other services they would like.

#### **Material and method**

After investigating the specialized literature and some available databases, as a data collection method we asked the participants (n=50) to fill out a self-written questionnaire. The sample was collected randomly from individuals who work in banks and sit while working. Altogether 24 women and 26 men filled out our questionnaire. The research was also helped by our own practical contribution. The paper-based questionnaires were filled by the participants' voluntarily on the spot after using a HPS service. Results: 46% of the examined population had already used a HPS service half a year before the current examination. From their feedback we can conclude that in favour of their health development they could utilise the advice in 83,47%. This resulted in a 69,56% efficiency in the preservation and development of their health. 76,52% of the participants marked a four (on a grading scale in which five is the highest), also a "satisfied" category during a measurement that reflected their results.

#### **Discussion**

From our research we can draw the conclusion that the spread of HPS programs is needed. They can be very helpful for employees in forming and maintaining their healthy lifestyles,

which is beneficial not only for the individual, but also for the employer and economy. Legislation in Hungary should be more supportive. It is important to mention that various tests, examinations, screening tests (which sometimes give a more precise result than routine examinations by doctors) should be combined to obtain a more significant result in determining a person's current condition.

**Keywords:**

Sport for Development and Peace (SDP), Refugees, European policies,

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**Bálint Flanek, Bettina Albert, Márk Kántor**

**Institute of Natural Science, Sportgenetics and Sportgerontology Research Group, University of Physical Education, Budapest, Hungary**

Supervisors: Adam Lelbach, Dr. Rose Private Hospital, Budapest, Institute for Translational Medicine, Medical School, University of Pecs | Akos Koller, Institute of Natural Science, Sportgenetics and Sportgerontology Research Group, University of Physical Education, Budapest

**Cardiovascular protection through regular physical activity - clinical translation of international research results**

**Introduction:**

Hypertension (HT) is an essential risk factor of cardiovascular diseases, with high worldwide prevalence due to unhealthy lifestyle. Recently, due to sedentary lifestyle and obesity the prevalence of hypertension is increasing in an alarming rate.

This – in part -due to the activation of the sympathetic nervous system and the renin-angiotensin- aldosterone system, which promote sodium retention and increased glucose intolerance (in type 2 diabetes mellitus). Aging due to the increased number of aged people become another risk factor for HT, especially because of early vascular aging (ECA) leading to arterial remodeling (stiffening) causing isolated high systolic blood pressure, and eventually heart failure.

**Hypothesis:**

In addition to the pharmacological/medical treatments physical activities and regular exercise have potential beneficial effects on systemic blood pressure.

**Materials and methods:**

By a critical overview of the literature the potential blood pressure-lowering effects of



different kinds of exercises were summarized. Special attention was given to those exercise modalities that can be beneficial in primary and secondary prevention of cardiovascular diseases. Also, some of the potential blood pressure-lowering mechanisms were looked for.

### **Results:**

The meta-analysis of Cornelissen et al. (2012) showed that isometric handgrip training may be more effective for reducing blood pressure than dynamic resistance training. Exercise training normalizes arterial baroreflex sensitivity (BRS), low-frequency systolic arterial pressure (SAP), and muscle sympathetic nerve activity (MSNA) in patients with myocardial infarction (Martinez et al., 2011).

According to Thorogood et al. (2011) isolated aerobic exercise although is not effective therapy for weight loss, yet it results in modest benefits in blood pressure-lowering and reducing dyslipidemia. A 6-month program of aerobic and resistance training lowered diastolic, but not systolic blood pressure in older adults with mild hypertension (Stewart et al., 2005). Pescatello et al. (2015) emphasized the combination of 30 minutes or more per day of moderate intensity aerobic exercise, preferably all days of the week and dynamic resistance exercise 2 to 3 days per week. Some of the important mechanisms that underline the beneficial effect of exercise programs were revealed by Koller et al. (1995) showing an increased nitric oxide dilator effect, whereas Hansen et al. (2011) reported a decreased level of the constrictor thromboxane and an increased level of dilator prostacyclin after exercise programs.

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## **Sándor Gergely Gabnai<sup>1</sup>, Lili Kósa<sup>1</sup>, Eliza Tóth<sup>1</sup>, Nikolett Schulteisz<sup>2</sup>, Judit Gangl<sup>2</sup>, Mahmoud Othman<sup>3</sup>**

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Supervisor: Ferenc Ihász

## **Longitudinal study of cardiorespiratory parameters of elite female handball players**

### **Introduction**

Many Hungarian and foreign researcher has already studied the cardiorespiratory parameters of elite handball players. There are a only a few studies though, which would separately study the changes in the functions of different apparatuses.

### **Purpose of study**

The aim of this study is to investigate the effect of an intervention (physical activity) on the cardiorespiratory system.

### **Hypotheses**

A well-planned intervention with sufficient length greatly affects the performance of the cardiorespiratory system and the body composition in a positive way. Studying the performance of the cardiorespiratory system in terms of a team might fade the individual functions and their changes. The qualitative and quantitative changes of the cardiorespiratory system are different in each player, thus it can be a limiting factor in terms of team-efficiency.

### **Methods**

In this study, 16 elite female handball players participated. Body composition was measured with "InBody 720", the parameters of the cardiorespiratory system was monitored with "Marquette 2000" treadmill, the resting and maximal pulse with "Cardiosoft", the aerobic capacity, ventilation and its components with Sensor Medics "Vmax 29C". During the analysis we followed the cogitations of Michalsik et al and Frenkl, that is each of the parameters ( $P_o$ ,  $MP$ ,  $VE$ ,  $V_t$ ,  $BF$ ,  $RQ$ ,  $VEO_2$ ) were monitored every 20 seconds from the beginning of the "steady state" until its end. For the statistical analysis, we used the Statistica for Windows. Between the two examinations 6 weeks passed, and during the intervention, 2 trainings took place every day, 5 days a week. The difference in mean values was analyzed with one-sample T-test;  $p < 0.05$ .

### **Results**

There was a significant decrease in relative body fat, and a significant increase in relative muscle mass. Remarkable positive changes occurred in the values of ventilation, oxygen pulse, and both in absolute and relative aerobic capacity as well. The mean values of the team developed as expected, but the individual changes in body composition and cardiorespiratory parameters are just as important. Firstly, we chose 4 players, who had the most outstanding changes. Secondly, we analyzed such parameters, which were expected to show adequate results in terms of the apparatus(es) functioning.

### **Conclusions**

Although valuable data could be collected upon these results, we must not forget, that different roles have different requirements, therefore continuing analyses and studies in this segment could also be profitable.

### **Keywords:**

cardiovascular and respiratory parameters, maximal workload, intervention

## **Balázs Róbert Garai**

**University of Physical Education, Budapest, Hungary**

Supervisor: Dolnegó Bálint, assistant lecture

# Research on Rule of The Game Knowledge of Hungarian Handball Referees

### **Introduction:**

I have been motivated to write my study as an active referee since 2012. It's basically expected of a referee to fully understand the rules of his sport. At the same time, the higher the category the referee is, the higher the criteria is.

### **Literature review:**

Bartha (2006) conducted a research on football referees, studied the rules -knowledge of coaches (Dolnegó and Bartha, 2011) and players (Bartha, 2008). In the 2011 research the coaches with Pro-Licence performed the best result. My research is matched by the long-term development strategy of MKSZ 2018-2024: Alkalmazkodó játékvezetés (Soós, 2017).

### **Purpose of study:**

The purpose of my research is to answer the following questions: Is the rule of the increasingly high-level referees better knowledgeable about their lower-class counterparts? Is the rule -knowledge of higher education graduates even higher? Based on the above, I formulated the following null hypotheses:

1. I suppose that there is no difference between the rule – knowledge of referees in the different frames.
2. I suppose that there is no difference between the rule – knowledge of the referees with different education graduates.

### **Methods:**

The test sample was given by the referees' frames of the Hungarian Handball Federation, Refereeing Subcommittee. (N=214). In terms of frames women and men are not separated. The sampling method is not probability, easily accessible people. The questionnaire was sent to the referees by the federation. The statistical analysis is carried out with Statistica for Windows Version 13 (Stat Soft Inc., 2016) with Kruskal Wallis ANOVA. The significance level in all cases was 5%. The questionnaire contained a 30-question textual knowledge test, where fillers have chosen the right answer from three options. As part of an anamnestic investigation I asked the referee's residence, school qualifications and other indicators.

**Results:**

The results of the research revealed that there is a significant difference between the national and the county, as well as the "A" and the NB2 referees. Based on the level of education, there is a significant difference between those with secondary or higher education and primary school graduates. The average score of the fillers is  $25.02 \pm 1.62$  from the maximum 30 points.

**Conclusions:**

From the results revealed that there is only difference between the county and the highest frameworks, as well as the "A" framework and the third class referees in rule-knowledge, so I reject my first hypothesis. However, it's gratifying that national frameworks are just above the expected level. Accordingly, the ranking of referees in a higher frame does not depend on the level of rule knowledge, but on other factors, such as physical, psychological etc. It's therefore worth pursuing the research with the involvement of these areas. In terms of school education, all the higher ranked groups compared to the primary school group showed a significant difference. so I reject my second hypothesis too. This may mean that the rules of the game are easier to learn for those with higher education qualifications.

**Keywords:**

handball, rule-knowledge, referee frameworks, profession

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## Regular Exercise as a Prevention of Cardiovascular Diseases

**Background:**

It is well known that high blood pressure is a significant pathogenic factor in the development of cardiometabolic diseases (Mozaffarian D, 2016), characterized - among others - by reduced elasticity of large- and medium size vessels importantly contributing to pathomechanisms of hypertension through numerous parallel acting pathways. It has also been shown, however, that non-competitive, regular physical training, dynamic type of exercise activities

are the most important factors preventing hypertension (Pedersen, 2015).

**Methods:**

We have reviewed and critically analyzed the available literature regarding the effects of regular exercise preventing cardiometabolic diseases through decreasing risk factors.

**Results:**

According to the results of Sousa (2013) combined aerobic and resistance training is effective in the chronic modification of blood pressure and lipid profile, as well as in the reduction of total risk in healthy elderly men. Intermittent hypoxia training in prediabetes patients has beneficial effects on glucose homeostasis (Serebrovska, 2017). According to Bakker et al. (2017) one hour of weekly resistance exercise was associated with 29% lower risk of development of metabolic syndrome (HR, 0.71; 95% CI, 0.56-0.89; PL.003) compared with no resistance exercise. Bocalini et al. found (2017) that water-ergometry exercise was able to induce expressive post exercise hypotonia and improve cardiac autonomic modulation in older normotensive elderly, as well as in hypertensive treated- or hypertensive untreated subjects when compared to conventional land-ergometry

**Conclusions:**

Combined aerobic and resistance training looks the most effective in chronic modification of cardiovascular risk factors in elderly. One hour of weekly resistance exercise reduced the risk of metabolic syndrome in population level, as well as intermittent hypoxia training most probable has a good effect and advisable in prediabetic patients to maintain glucose homeostasis.

**Keywords:** cardiovascular diseases, exercise, prevention, elderly

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**Bence Kelemen**

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Supervisor: Dr. Zsolt Gyimes, associate professor

**The comparison of male 1500m elite runners' winning and record tactics**

The research focuses on the comparison of the all-time best 1500m male distance runners' races using typical winning (W) and record tactics (R). We analysed 26 races (n=26: R 13; W 13) in order to find out if there is any difference in pacing and tactical behaviour. In our

research, video analysis (Kinovea 0.8.15 programme) was used. Instantaneous positions and intermediate splits at 400, 800, 1100, 1200m and the final result at 1500m were monitored and analysed. The data was examined through statistical procedures, including deviation, average, and T-pattern analysis.

Mean race speed, hence the mean final performance were found significantly ( $p < 0.05$ ) better in R group compared to W group (R 3:28,28  $\pm$  1,3s; 7,20  $\pm$  0,04 m/s vs W 3:37:22  $\pm$  4,9s; 6,90  $\pm$  0,15m/s). There was no significant difference found in the average speed of the first and last 400m in the case of R (7,30  $\pm$  0,10 m/s vs 7,34  $\pm$  0,10 m/s). Similarly, no significant difference was found in the case of the two slowest average 400m speed (7,03  $\pm$  0,08 m/s vs 7,09  $\pm$  0,11 m/s).

These were measured between the 400m mark and the 800m mark and between the 800m mark and the 1200m mark. The average speed of the first 800m and the last 700m were significantly different in both R and W cases; however, the contrast in significance was more remarkable in W group (R: 7,16  $\pm$  0,06 m/s and 7,24  $\pm$  0,6 m/s , W: 6,52  $\pm$  0,29 m/s and 7,39  $\pm$  0,11 m/s). In the W group, the two slowest 400m average speeds were measured during the first two laps, there was no significant difference between those two (first lap's average: 6,45  $\pm$  0,30 m/s vs second lap's average: 6,59  $\pm$  0,39 m/s). The highest average speed was reached by the runners during the last 400m (7,58  $\pm$  0,19 m/s).

This was significantly better than the second highest average 400m speed, which was reached between the 800m and the 1200m mark (7,22  $\pm$  0,14 m/s). In group R, there was no significant difference ( $p < 0.05$ ) in the instantaneous positions of the runners between 400m and 800m; 800m and 1200m; and 1200m and the finish line at 1500m. In the case of W tactics, there was significant difference in position between 800m and 1200m (4,79  $\pm$  2,68 and 2,61  $\pm$  2,63); however, there was no difference neither between 400m and 800m and nor between 1200m and the final places. The final places achieved by both tactics were almost the same (R: 1,76  $\pm$  1,36 and W: 1,53  $\pm$  0,77).

Significant difference was shown at instantaneous positions at the 400m mark (R: 3,15  $\pm$  2,99 vs W: 5,46  $\pm$  3,15). Significantly ( $p < 0.05$ ) higher number of mean overtakes were performed in all cases in group W. The highest difference was measured while changing positions between 800m and 1200m (R: 0,69  $\pm$  0,94, W: 2,15  $\pm$  2,64).

**Keywords:** 1500m, tactics, pacing

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## Virág Kis

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## Examination of athletes' eating habits in various ice skating sports, disciplines

### **Introduction:**

Nowadays nutrition gains more and more attention in the world of sport, especially in competitive sport. During the composition of diets of suitable quality, we have to take into consideration the need for increased energy, macro-, micronutrients, the changed circumstances (extremist temperature, mountain air, intensified metabolism, variable strain), the age, sex and anthropometric particularity.

### **Aim of the study:**

To assess the frequency of consuming different types of food in the Hungarian national short-track speed skating, speed skating and synchronized skating teams, both in the adult and junior age groups; to compare the results in a general view and also in the view of sports and age groups. Since in Hungary these sports have not been examined in this aspect, our goal is cognition as well as assessment.

### **Materials and methods:**

We used a standard Food Frequency Questionnaire, which consists of 58 questions. The participants were older than 14 years, there were short-track speed skaters (n=51), speed skaters (n=18) and synchronized skaters (n=31).

### **Results:**

The principles of a healthy diet are present in most of the cases. The main part of the participants does not pay attention to what they eat. Bigger differences can be observed in the junior age groups, and also there are shortcomings in the diets.

### **Conclusion:**

Both in the junior and adult age groups the suitable education on healthy diets is important, also the proper quantity and quality energy- and nutrients intake should be granted. This way athletes can achieve a better performance, stamina and body composition.

**Keywords:** short-track speed skating, speed skating, synchronized skating, nutrition intake, sports nutrition

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## **Roland Kiss**

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Supervisor: Dr. Farkas Judit, Quality Assurance and Accreditation Office, UPE

## The examination of the role of informal learning outcomes in performing competition organisation activities and duties of sports experts

### **Introduction:**

Informal knowledge is unplanned and unorganized activity; in our life this is the most common learning form. Unlike formal education during informal education, learning is not a direct goal it is more like a side-activity, which is beneficial for the sport segment. Everyone who is in the sport life for many years and going to the competitions, they acquire more knowledge in an involuntary way. It helps them to do a better job in the other side of the sport. This means They can be better sport experts. To get the right qualification in organized form is important, but The experience shows us the informal knowledge what we get when we do our sport is irreplaceable. Moreover, the person who is not active in sport is not able to get that knowledge in formal education.

### **Research Questions:**

We didn't find research segment where they wrote about how can be use the informal knowledge area to develop the human resources skills. We take two questions. How can will be help for us to develop the human resources segment? And the second, We would like to know the professional sport how can use to be a better sport experts, or how can a professional sportman or sportwoman transfer her or his knowledge in the sport works like a manager or coach. We focused in the sport events organizing.

### **Methodology:**

We apply two different research methodology. First we did a personal semi structured interview. We created 8 questions. After when they answer tot he questions w eget informations and we work whit tham. We selected 3 differrent tipe of sport manager.

1. We were looking for a sportsman who works in the same sports that he has been (athletic) since he was a child, competed and socialized.
2. We were looking for a sportsman who works in other sports than he has been athletic (live) since he was a child, competing and socializing.
3. We were also looking for a person in a sports organization who was only short time or not at all sporty and had no transferable knowledge

We analysed documents and literatures: a sportmanagement book and treatise and educations literatures in hungarian and english,plus the Europien and Hungarian Taekwondo federation's documents and laws.

### **Results:**

We would like to raise one result, the others I would like to talking about in my perfor-



mance. The A and B interviewee sad to us They haven't got big problame to organize an event or do the everyday activities in the sport life. In contrast to the C interviewee had many difficult activity what he can't do because he hadn't got any transferable knowladge He was a parent hwo save the club tot he closing.

### **Conclusions, suggestions:**

- Part of the sport-specific organizational knowledge elements acquired during the long years of sport (<6 years) can not be accommodated, but, many years can be learned by experienced practitioners, with the required qualifications and with formal learning.
- In sports where sport specific knowledge is indispensable, there is a need for a specific sporting athlete's time.
- The formal education and the informal learning need to compliment each other

Our research focuses on the organization of sporting events, and focusing on the sport experts who are work in the sport segments and focus to the competences it needs.

We create 3 different tipe of sport knowladge what you can rich when you are an active player. The training world, The competitions world, and the sport federations or clubs world. We want to inspire our research associates to better understand the contexts on this topic and understand how knowladge can be learn in the informal way. Nowdays in the educations the informal knowladge is important. Many association deals whit the issue how can be more effective this way. The future sport experts will be easier translate they sport specific knowladge and they informal knowladge to they special sport work.

**Keywords:** sport, learn, knowladge, organization

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## **Luka Kolar, Marko Stupin, Ana Stupin**

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Supervisors: Ines Drenjančević

## **What can we do to prevent athlete's sudden death?**

Little is known about the risk of sudden death related to exercise in young athletes, and whether there are more benefits than damage from exercise. By recent studies, there is 2.5 fold increased risk of sudden death in competitive athletes than sedentary peers. There is also proved that most common causes of sudden death are silent cardiovascular diseases. A broad spectrum of cardiovascular diseases can cause sudden death, including congenital

and inherited disorders. Hypertrophic cardiomyopathy is implicated as the prime cause of sport-related cardiac arrest (more than one-third), and other common causes include congenital coronary artery anomaly. Myocarditis, aortic rupture, mitral valve prolapse, arrhythmogenic RV cardiomyopathy, conduction system abnormalities are less common.

Most of these conditions (up to 60% of sudden deaths) can be diagnosed or suspected with ECG. In addition to ECG, athlete's history and detailed physical examination is necessary to do. Complete personal and family history is important because of genetically determined diseases, and it is considered positive when close relative (aged <55 for male and <65 for female) had experienced a premature heart attack or sudden death, or had diagnosed other heart disease. Physical examination can be used to find heart murmurs, irregular heart rhythm and elevated arterial pressure. Twelve-lead ECG can suggest myocardial ischemia, cardiomyopathy and rhythm and conduction abnormalities. Subjects who have positive findings should be referred for additional testing, first noninvasive such as echocardiography, 24-h ambulatory Holter monitoring and exercise testing. If it is necessary, invasive testing is recommended (ventriculography, coronary angiography, endomyocardial biopsy and electrophysiological study). Finally, subjects recognized to be affected by cardiovascular conditions potentially responsible for sudden death in association with exercise and sport participation should be disqualified from competitive athletic activity.

Incidence of sudden death among athletes is 2.3 per 100 000 athletes with significant male predominance (male to female ratio 10:1), which prompted European Society of Cardiology to make consensus statement for pre-participation screening of young competitive athletes for prevention of sudden death. According to this statement, beside personal and family history and physical examinations, ECG found an important place in diagnosing cardiovascular diseases related to sudden death. Apart from being widely available and inexpensive, it serves as a criterion for further examinations or even disengagement from sports.

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## **Lili Kósa**

**Eötvös Loránd University, Savaria University Center, Szombathely, Hungary**

Supervisors: Prof. Ferenc Ihász, Eötvös Loránd Tudományegyetem Savaria Egyetemi Központ, Szombathely, Hungary

## **Development of cardiovascular system among kayak-canoe riders with continuous pulse control**

### **Introduction:**

Endurance is a resistance to fatigue, maintaining a certain level of performance. Endurance is influenced by the development and fitness of the heart, circulation, respiratory system,

aerobic capacity and utilization (absolute and relative aerobic capacity), the operational level of aerobic and anaerobic metabolic processes, level of technical knowledge, the level of use of psychic properties, strength-fitness level.

### **Material and Method:**

The study took place in Szombathely among three daughters and one boy between October 2017 and January 2018. The body composition was measured using "InBody 720" bioimpedance, the characteristics of the cardio respiratory system were measured with H / P Cosmos LE200CE (DE 83365 Nussdorf-Traunstein Germany), until total exhaustion. Before, during and after the exercise, we monitored the pulse changes with "Polar H7 Bluetooth 4.0 Smart" chest transmitter. The resting ( $P_o$ ) ( $l \cdot \text{min}^{-1}$ ) and maximum pulse ( $M_p$ ) ( $l \cdot \text{min}^{-1}$ ), aerobic capacity ( $VO_{2\max}$ ), ventilation  $VE$  ( $BTPS\ l \cdot \text{min}^{-1}$ ) and its components were measured with CPX 50/60 Hz (CareFusion Germany 234 GmbH 97204 Hoechberg).

### **Results:**

The results obtained before and after the preparation showed significant improvements in both the circulatory, respiratory and metabolic backgrounds. Regarding the proportion of body composition (muscle fat), we could also observe a positive change. In addition to the laboratory tests, we continued to follow the athletes during the workout planning process, which was controlled by continuous pulse control.

### **Conclusion:**

Regular exercise-related examinations and pulse control significantly contributed to the effectiveness of training planning.

**Keywords:** kayak canoe, endurance, preparation period, pulse control

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## **Magdalena Krawiec**

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Supervisors: Anna Kuk, PhD, Jozef Pilsudski University of Physical Education, Warsaw, Poland | Lilla Török, University of Physical Education, Budapest, Hungary

## **Occupational burnout among physical education teachers in Warsaw and Athens**

In our cross-cultural research we have investigated the issues of burnout and stress among

Polish and Greek samples. The aim of the research was to determine the level of occupational burnout, stress and different stressors and how they affect physical education teachers in Warsaw and Athens. Similarities and differences have been identified. The following hypotheses are formulated in this paper:

Hypothesis 1: Greek teachers show higher level of stress than Polish do.

Hypothesis 2: Psychosocial stressors are the most strongly influencing type of stressors for both groups.

Hypothesis 3: Differences can be found in terms of occupational burnout and stress between Varsovians and Athenians.

In our research the following questionnaires have been used:

- the scale of sensitivity to stressful situations by H. Lindenmann (1974),
- LBQ Burnout Questionnaire by Massimo Santinello (2014),
- an original questionnaire about the stressors that affect the negative attitude to the work the strongest.

The research was carried out on two groups of 30 people. The first of them were Polish teachers teaching in Warsaw at the elementary and secondary school stage. The second group were Greek teachers in Athens, at the same stages of education. The research was carried out in various schools in January and February 2017. Based on the results obtained in this study, Polish teachers show a higher level of occupational burnout, while Greek teachers are lower in this respect. Also, psychosocial stressors are the most strongly influencing stressors among both nationalities. In this work, we paid attention to the problem of burnout syndrome and its international character. By comparing two nationalities, we are able to identify new symptoms, aspects and causes of burnout, which may be foreign to one country and which pose a significant problem in another. This does not mean, however, that a given problem will never appear in a place where it was previously unknown. The studies that compare cultural and characteristically distant countries, give the opportunity to see a new stressor, and thus prevent it from happening and counteract its appearance.

**Keywords:** burnout, occupational stress, stressors, Poles, Greeks

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**Anna Dorina Lenkei**

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Supervisor: Dr. Szilvia Perényi

## The Dimensions of Spiritual Minimalism In Lifestyle Habits

The world of consumer society is based on the financial ability of purchasing from the

available goods on the market. In this world, people work for financial achievements which enables them to stay in the loop of the artificially constructed consumption engine. A lot of times this circle creates overconsumption activities demanding increased time and effort from people. More and more research has showed, however, that the material world does not contribute to the feeling of life satisfaction of humans. Furthermore, the consumption circle causes unneeded stress and harm on both of the environment and people on the individual and societal level. In recent years spiritually driven globalised movement started against the mainstream consumption oriented lifestyle. In this life view people consciously try to limit commercially driven product purchases and service consumptions to live healthier and more contentfull, while attempt to reduce their ecological footprint. It is the question what are the reasons behind this phenomena and behaviour, what makes people start and stay on the road of the journey towards minimalism. Personal interviews were conducted with people who represent minimalism in order to gain a deep understanding of their life views and practices and an online questionnaire was distributed among higher education students enrolled in sport related academic programs. The following four areas were examined in connection of the topic: 1) environment; 2) belief and spiritualism; 3) consumption; and 4) lifestyle including dietary and sporting habits. It was found that the available information, mostly believed to be outside of the mainstream media, enabled minimalists to change their lives, and start conducting new daily habits. urprisingly, sport specific higher education students implemented limited elements of the four examined dimensions in their life views and habits.

**Keywords:** spiritual minimalism, conscious consumption, lifestyle, sport participation, health behaviour

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**University of Physical Education, Budapest, Hungary**

Supervisor: Judit Balogh assistant lecturer

A possible investigational method of the improvement of the performance in the youth basketball program, with the simultaneous use of complex conditional and special shooting programs

**Introduction:**

From the aspect of the energy management, today's basketball player profile can be divided

to four resources: *physical, mental*, spiritual and emotional (**Woods, Jordan, 2010**). We intended to observe the physical and mental part of this system. In every age category the athletes must increase their current potentials and reach the master or expert level (**Baracskai, 2007**). Our research supervised the special basketball demands and the implementations to a training program that could help us to get a correct picture what, when, whom, how, where and why to teach (**Winter, 1997**). We researched the game performances as the ingredients of competitiveness based on a research of **Boston, 2010** that broke down the game and gave us exact scientific data of the modern basketball game. On the other hand we took the works of (**Baker and Shea 2013**) and the theory of **Four Factors by Dean Oliver (2004)** as our starting points.

### **Purpose of study:**

Evaluate of every scientific hypothesis.

Observing a special shooting and conditional program that is used yearly and simultaneously for a men university basketball team. The main goal of our research is to analyze the common effects of these programs for the game performances of the players in order to understanding the sports carrier profiles of the participants regarding to their game performances. We'd like to find the details of the improvement of the game performances with new methods that will separate the team and individual parts of the training process. Our hope is that our results, findings will be useful for planning the basketball practices. We look for the answers which practice topics, drills, tests, types and methods are the most effective to increase the special game performance in this model.

### **Methods:**

- We looked for the answers to why and how questions with our descriptive research methods. We guaranteed the validity of our work to choose our model systematically.
- We decided to use a voluntary questionnaire to understand the level of their professional knowledge.
- We followed a longitudinal and panel investigation to guarantee the proper tests data.
- The data were analyzed statistically with ANOVA, regression, T probe.
- We have also used some expert explanation from the gathered data.
- Hudl video analyzer program

### **Results:**

1. The number of the high intensity sprint increases with the more ball possessions. (56/game, every 43-45 sec)
2. The maximal vertical jumps of the players are predictable with the sum of the field goal attempts + blocks + rebounds (cc.10%)

3. The defensive footwork is only 28 % of the playing time of a player.
4. The game statistics of the players who took part on the individual shooting and conditional program do not affect the trend lines of the game performances
5. The eFG% and FTF do not affect the trend lines of the game performances. No significant different because of the field goal and free throw attempts (434/193 - 88/49 és 99/78 - 39/26)
6. The players who were involved of the morning sessions had more attempts on the games and so higher point/game averages. (49,3 PPG - 14,1 PPG) They executed their shots with a colorful technical repertoire. Their game performance and statistics were more effective.

### **Conclusions:**

The longitudinal investigation was reasonable because the goals and the programs must be changed within the yearly practice plan. The teaching methods depend on the changes of the offensive strategy of the team. The more information we have about the physical and mental resources, the effective practice plan can be designed. A competitive conditional and shooting program can be properly designed that will consider the significant variants due to our findings. There is a significant connection between the performance of the practice program and the game performances.

**Keywords:** Shooting program, conditioning, improvement of performance, physical resources, trends of the performance

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## **Bence Simon, Eszter Tóth**

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Supervisors: Kornélia Orbán, lecturer | Andor H. Molnár, associate professor

## Risk factors of the female athlete triad among Hungarian water polo players

### **Introduction:**

The diagnosis of female athlete triad (FAT) requires the presence of an eating disorder (ED), amenorrhea (AM) and osteoporosis (OP). The relevant literature is controversial about the frequency of FAT among athletes of different types of sports or non-athletes. Previously, there were no studies about the FAT's incidence among water polo players.

### **Purpose of study:**

Our purpose was to determine the prevalence of FAT's risk factors among female water polo

players and to compare these risk factors with their prevalence among physically inactive women.

### **Methods:**

69 water polo players (WP) of the Hungarian national championship and 64 physically inactive (CTRL) university students participated in the study. We used the method of Torstveit and Sundgot-Borgen (Med Sci Sports Exerc, 37, 184-93, 2005), completed with bone densitometry (SONOST3000), to identify the risk factors of FAT. The risk factors of ED were low BMI, pathogenic weight-control methods (use of diet pills, hunger-repressive pills, laxatives, diuretics, or vomiting to reduce weight), self-reported ED, results over the critical limit in 'Drive for Thinness' or 'Body Dissatisfaction' subscales of ED Inventory (Garner et al., Int J Eat Disord, 2, 15-34, 1983). The risk factors of AM were self-reported menstrual dysfunctions (primary amenorrhea, secondary amenorrhea, oligomenorrhea or short luteal phase). The risk factors of OP were self-reported stress fracture or low bone mineral density (osteopenia or osteoporosis).

### **Results:**

We detected significant differences in the occurrence of low BMI (CTRL: 12.5%; WP: 2.9%\*) and self-reported eating disorder (CTRL: 1.56%; WP: 27.54%\*). In the WP group the self-reported ED was more frequent than the other types of ED's risk factors. The aggregated risk factors of ED occurred in similar rate in both groups (CTRL: 40.63%; WP: 36.23%). Oligomenorrhea was more prevalent in the CTRL group (CTRL: 35.94%; WP: 15.94%\*). In the WP group the short luteal phase, and in the CTRL group the oligomenorrhea was more frequent than the other types of AM's risk factors. The rate of the cumulated risk factors of AM was similar in both groups (CTRL: 50.0%; WP: 39.13%). Osteopenia was significantly more prevalent in both groups than the other types of OP's risk factors. We could not detect any significant differences between the groups in the incidence of the aggregated risk factors of OP (CTRL: 48.44%; WP: 46.38%). The rates of participants with risk factors of ED and AM (CTRL: 21.88%; WP: 5.8%\*), or ED and OP (CTRL: 17.19%; WP: 5.8%\*), or AM and OP together (CTRL: 26.56%; WP: 5.8%\*) were lower in the WP group.

10.94% of the CTRL group and 13.04% of WP group has at least one risk factor of all the three components of FAT. We did not observe any difference between the groups in the occurrence of FAT's risk factors.

### **Conclusions:**

Our results suggest that, similarly as in the CTRL group, the risk factors of FAT are very prevalent in the WP group. For water polo players it would be beneficial to pay attention to the prevention or treatment of the FAT and its risk factors, because these problems could impair their quality of life and sport performance.



## **Tímea Szabó**

**University of Physical Education, Budapest, Hungary**

Supervisor: Dr. Judit Farkas, Quality Assurance and Accreditation Officer

### Volunteering abroad and its possible positive effects in Hungary

#### **Introduction:**

According to the KSH 2012 national survey, almost 30% of the adult Hungarian population provide assistance free of charge, without compensation. This is called volunteering, the social, economic benefits of which are well known. Involving young people in the School Community Service program can help improve this indicator. Students graduating in maturity are required to fulfill some voluntary service within 50 hours. The author has 15 national and international sports and other events, volunteering in a professional organization and experienced all its benefits.

#### **Purpose of study:**

As a recreation-health promotion student and as an educated andragogy-educator, we seek out how to increase the number of domestic volunteers after a successful service abroad - what further recommendations can be made on the basis of experience and research results for more effective involvement of young people.

#### **Research questions:**

Our research questions were:

1. How did volunteering abroad allow interviewed subjects to find / complete themselves, and how to motivate others as well?
2. How can volunteering lead a community?
3. What is the motivation for someone to work without pay?
4. Why do you volunteer to work abroad and what is paid back?

#### **Methods:**

To answer our questions, we applied the following qualitative research methods: 1) Literary analysis; 2) document analysis; 3) making an in-depth interview (empirical study). We used books, studies and policy documents on theoretical foundation on volunteering and self-realization. Resources contributed to jointly linking volunteering on the international scene with self-realization. Our empirical testing method was to make a deep interview. We searched for five Hungarian interviewers who are leaders or coordinators of international voluntary organizations.

#### **Sample the interview subjects:**

It was important that, based on the features of the organizations, they represented several

different subjects: 1) The organization's scope of activity is different; 2) The organization is part of a larger international voluntary network; 3) The volunteer of the organization found itself, motivating others; 4) The existing volunteer organization's current position is a leader or coordinator.

**Results:**

The results revealed to us that the properties at the top of the Maslow pyramid, the elements called aggregate self-realization, vitality, creativity, self-preservation, and purposefulness have evolved during the volunteer months abroad. During the interviews, it was revealed what motivated the interviewees to find out what became interesting for volunteer work, what attracted their attention and motivated them for volunteering or, for example, what motivates someone to work without pay. Technical issues such as how did the interviewer contact the sending organization (where they heard of them, etc.) are important because volunteering abroad is limited to young people, and we have also made recommendations to improve it. We have learned how to devote community to volunteering, why it comes to volunteering abroad, and how the world view in the domestic dimensions of internationalism is evolving.

**Conclusions, recommendations:**

Based on the results of the research, 5 conclusions were drawn, which are the result of higher levels of self-awareness among foreign higher volunteers, the causes of unpaid work, personal development and the possibility of developing some key competencies.

In the research, we focused on the European Voluntary Service (EVS) system as one of the best examples of volunteering abroad in terms of organization, recruitment and funding, under which young people aged 17 to 30 can volunteer abroad for a shorter or longer time at a socially beneficial organization / therefore the proposals were also developed for this target group.

**Keywords:** volunteering, international experience, youth, European Volunteer Service, self-development

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**Vivian Esther Taylor, Veronika Kiss**

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Supervisors: Ottó Benczenleitner, PhD associate professor | László Tóth, PhD associate professor | Dániel Mezei, Head of PR and Communication

Attitudes towards doping – a comparison of athletes, non-athletes, and sport experts

## **Introduction:**

The estimated range of various doping substances and procedures used in sports ranges from 10% to 90% (Yesalis & Bahrke, 2005). In the past years this topic has been researched mainly by the biomedical point of view, even though psychosocial approaches are also key factors in the fight against doping (Hanspeter, Lamprecht & Kamber, 2014). While this topic is well researched in international literature, we did not find any comprehensive articles on the attitude towards doping use here in Hungary. This scientific field is very important because doping is not only harmful to the physical health of athletes, but it also brings problems to their athletic identification as well. (Kirby, Moran, & Guerin, 2011)

## **Purpose of study:**

We are examining this topic in Hungary as a pilot study - the attitudes towards doping - a comparison of athletes, non-athletes, and sport experts. The aim of this study is to explore participants' attitudes towards doping use in sport.

## **Methods:**

For our research we sent out online surveys, which were anonymously filled out by 358 participants. From the information that we received, we divided the answers into different sections.

Firstly, the social groups i.e. students at the University of Physical Education, the faculty at the University of Physical Education, and people who do not have any contact with the University. Secondly, the separation of gender, where there is a difference in males and females. Finally, we examine age groups (under 30, 30-50, above 50). We used SPSS 22.0 program to analyze the answers received through our survey. After the frequency tables were made, a Chi square test was used to analyze cross tabulation of the survey data.

## **Results:**

Our research reports on attitudes towards doping in Hungary from various surveys aimed at the non-athletes of general population, elite athletes and sport experts. Analysis of the data showed that the opinions of men and women involved in the study reflected a clear difference in their attitudes toward the use of doping ( $\chi^2=7.59$ ,  $p<.006$ ). There was a question where we asked if they think doping use is existent in their own sport, and the results showed a difference between genders ( $\chi^2=11.0$ ,  $p<.004$ ). We got similar results when we asked if they would use doping substances if their international results would depend on it ( $\chi^2=13.45$ ,  $p<.000$ ). This result is reflected in the different age groups. For example more people under the age of 30 would use doping, then those above the age of 30 ( $\chi^2=8.36$ ,  $p<.015$ ).

Non-athletes are less likely to think that Hungarian athletes use doping than student athletes ( $\chi^2=13.63$ ,  $p<.001$ ). People who do not criticize doping, rationalize that it is essential in professional sports ( $\chi^2=7.96$ ,  $p<.047$ ).

### **Conclusions:**

Our findings suggest gender and age have an impact on attitudes regarding doping. Young males are more accepting of doping use. Our results conclusively show that doping is accepted because of the belief that it is indispensable at the top level of competition. This phenomenon is called a “false consensus effect”, which often appears in subcultures as an egocentric bias (Ross, Greene & House, 1977). Our future research will develop further insights about attitudes towards doping. We will continue to explore the topic with standardized test of a representative sample.

### **References:**

1. Hanspeter, S., Lamprecht, M. & Kamber, M. (2014). Attitudes towards doping – A comparison of elite athletes, performance oriented leisure athletes and the general population. *European Journal for Sport and Society (EJSS)* 12 (2): 171-189.
2. Kirby, K., Moran, A. & Guerin, S. (2011). A qualitative analysis of the experiences of elite athletes who have admitted to doping for performance enhancement *International Journal of Sport Policy and Politics* Vol. 3, No. 2, 205–224.
3. Ross, L., Greene, D., & House, P. (1977). The false consensus effect: An egocentric bias in social perception and attribution processes. *Journal of Experimental Social Psychology*, 13(3), 279-301.
4. Yesalis, C. E., & Bahrke, M. S. (2005). Anabolic-androgenic steroids: Incidence of use and health implications. *President’s Council on Physical Fitness and Sports Research Digest* 5(5), 1-8. Washington, DC: President’s Council on Physical Fitness and Sports.

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## **Eliza Eszter Tóth**

**Eötvös Loránd University, Szombathely, Hungary**

Supervisors: Lili Kósa | Prof. Ferenc Ihász | Prof. Ákos Koller

## **Examination of Cardiorespiratory and Metabolic Responses in endurance athletes and members of Counter Terrorism Centre**

### **Introduction:**

Exercise is a great challenge for homeostasis, which created a variety of cells, tissues and organs by increased skeletal muscle activity. During the physical activity numerous acute and adaptive responses come from the metabolic activity of the skeletal muscle and the heart. The body responds to a variety of cardiovascular, respiratory, nervous and hormonal responses to increased energy and oxygen requirements.

### **Methods:**

11 men ( $28 \pm 5.74$  average age) participated in the study. We tested and compared the load of two groups (endurance athletes ( $n_1 = 4$ ) and members of the Counter Terrorism Center ( $n_2 = 7$ )). Body composition was measured with „Inbody 720” bioimpedance analyser and cardiorespiratory fitness was measured by „Marquette” 2000 treadmill (Pittsburgh, PA, USA) to maximal fatigue. The maximal heart rate ( $HR_{max}$ ), ( $\text{beat} \cdot \text{min}^{-1}$ ) “Cardiosoft”, (Milwaukee, USA), aerob capacity ( $VO_{2max}$ ), ventilation ( $\dot{V}E$ ) ( $\text{BTPS l} \cdot \text{min}^{-1}$ ) and its components were measured by Sensor Medics “Vmax 29C” (Yorba Linda, CA, USA).

### **Results:**

There wasn't significant difference between the average height of the two groups ( $BH_1 = 173 \pm 5.16$ ;  $BH_2 = 183 \pm 9.47$ ) as well as fat and muscle ratio ( $M\% 1-2 = 50.7 \pm 3.1$ ;  $F\% 1-2 = 11.3 \pm 4.8$ ). However, there is a significant difference between body mass averages. The members of Counter Terrorism Centre are 16,5 kg heavier than endurance athletes ( $BW_1 = 68.3 \pm 4.7$ ,  $BW_2 = 84.7 \pm 7.8$ ) ( $p < 0.05$ ). The athletes' time of load is better ( $L_1 = 15.5 \pm 2.4$ ) than the members of Terrorism Centre ( $L_2 12 \pm 1.6$ ) ( $p < 0.05$ ). There was correlation between the relative aerobic capacity ( $RVO_{2max} = 60.16 \pm 7.5$ ) and the maximum pulse ( $HR_{max} = 189 \pm 11.6$ ) ( $p < 0.05$ ). As for the performance of the respiratory system, the difference of respiratory quotient averages ( $RQ_1 = 1.09 \pm 0.009$ ;  $RQ_2 = 1.28 \pm 0.05$ ) was significant.

### **Conclusions:**

The forces of counter terrorism receive a special physical training Endurance athletes mainly do aerobic exercises, while the members of Counter Terrorism Centre develop endurance and strength too, thus responding to the extreme loads adaptively.

**Keywords:** cardiorespiratory fitness, endurance, strength, athletes

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## **Kristóf Világi**

**University of Physical Education, Budapest, Hungary**

Supervisor: Dr Sterbenz Tamas, vice rector of the University of Physical Education

SAUS Hungary - Mapping the Hungarian sport analytics and sport IT level, creating a development plan to apply sport analytics

### **Introduction:**

Data in sport can be a powerful tool for sport organizations to improve the quality of

the workflow and to increase productivity. In sport science projects it can provide us various ways starting from using from analyzing athlete's performance to even rationalizing administrative tasks. But how well the sport organizations in Hungary are seizing these possibilities? The Sports Analytics Use Survey which was conducted in 2012 in the USA was looking for this answer among *major* league franchises. Twenty-seven organizations participated from each of four leagues. Using this methodology, I created a survey system which can help us to get a detailed picture of the sport analytics in Hungary.

**Purpose of Study:**

To find out on which level of sports analytics usage the sport organizations are and create detailed plans to develop their methods. To achieve this result in my study I am answering these questions:

1. Which ways can sport analytics be used to increase the efficiency of a sport organization?
2. How well Hungarian sport organizations are using sport analytic methods currently?
3. What type of suggestions can be created to apply these methods in the core of the organization's workflow?

**Methods:**

To answer these questions, I utilized different scientific methods: Analyzing SAUS I created a multi-level survey-system tailored for organizations. In this research I surveyed 50 top tier clubs from different team sports and compared the results with a benchmark established by the result of the original SAUS. Also interviewing multiple domestic and foreign sport analytic experts to collect experiences and ideas about systems that are already used.

**Results:**

In Hungary there are numerous teams and federations that have applied sport analytics of some sort, for these organizations I created suggestions to how to fine-tune and enhance these methods even more. For those clubs who did not take even the first steps to integrate sport analytics we have to start from building from the basic steps. Both individual and team sports have developed a demand for analytics however because of the lack of special skillset and IT knowledge it can be used with limited efficiency.

**Conclusion:**

This survey holds numerous possibilities, it can be used as a foundation of a system which can produce guidelines and consulting plans for teams, federations or athletes in Hungary.

**Keywords:** sports analytics, sports management, survey system

## **Christian Tolstrup Wester**

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Supervisors: Anders Grøntved, Associate Professor, PhD | Heidi Klakk, Associate Professor, PhD

## Development and Validation of a Questionnaire to Assess Leisure Time Screen-based Media Use in Children

### **Introduction:**

Children spend high amounts of time engaging in activities on screen-based media devices; however not much is known about the potential consequences of excessive use of screen media at children's physical, mental and social health. There exist no larger validated questionnaire batteries to assess screen time and screen behaviour in children.

### **Purpose:**

The objective of this study was to develop and evaluate a parent-reported questionnaire instrument to assess leisure screen time and behaviour among 7-9-year-old children and further to evaluate item correlation and test-retest reliability for two core items in the final questionnaire related to screen time use.

### **Methods:**

An initial questionnaire draft was made in the research group, in an iterative process. First, content of the items was assessed through key-informant interviews with 10 parents to 7-9-year-old children. Secondly, 10 experts were asked to evaluate the questionnaire items, and finally the questionnaire was assessed and adjusted in the research group. The final screen-time and behaviour questionnaire was sent to  $n=37$  parents to investigate correlation between the two screen-time-use items using Spearman's rho and further to assess test-retest reliability through a Bland-Altman plot.  $N=35$  parents answered the questionnaire the first time (Q1), and  $N=31$  the second time (Q2).

### **Results:**

The analysis showed strong correlations (Spearman's rho: Q1 ( $N=35$ ): 0,61 for weekdays, 0,63 for weekend days, Q2 ( $N=31$ ): 0,75 for weekdays, 0,72 for weekend days). The test-retest reliability showed strong correlations as well (item 9 weekdays  $r=0.68$ , item 13 weekdays  $r=0.83$ , item 9 weekend days  $r=0.75$ , item 13 weekend days  $r=0.91$ ). Bland-Altman-plots (B&A-plots) was made for the test-retest reliability assessment as well, and showed acceptable mean differences (values in min/day, weekdays: 2.7 (item 9), 2.4 (item 13), weekend days: 18.2 (item 9), 18.8 (item 13) and total use: 20.97 (item 9), 21.3 (item 13)).

### **Conclusion:**

The screen-based media use questionnaire was successfully developed, and the two core items relevant for screen-time, was shown to be strongly correlated. The test-retest reliability showed strong correlations and there was acceptable agreement in the B&A-plots. The two screen time items are recommended to be used in studies for the same age group, in Denmark. Further it would be relevant to assess the last 17 of 19 items in the questionnaire battery.

**Keywords:** Questionnaire, screen time, children, test-retest reliability

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### **Chang Yin**

**National Taiwan Sport University and University of Physical Education, Budapest, Hungary**

Supervisor: Prof. Akos Koller, University of Physical Education Budapest, Hungary

A case report of the usefulness of conservative therapies of herniated intervertebral disc (HIVD) in a male gymnast

### **Introduction and Purpose of study:**

The presence of lumbar pain is very frequent in gymnasts and various treatments are applied to alleviate it. During my athletic trainer internship for one year at a gymnastics sport team in Taiwan I met a gymnast who complained about an uncomfortable low back pain in his muscles around his spine after everyday training. As the competition was coming, the training became more intense and his low back pain got worse. After a few months of follow up, he was diagnosed with herniated intervertebral disc by magnetic resonance imaging (MRI).

### **Methods:**

During my stay I thoroughly investigated this problem. First I conducted literature research on the internet and textbook from the library, aiming to find out what of methods are available to reduce low back pain and most importantly, to elucidate the origin of his pain during and after the training. Then he participated in a seven-months program of rehabilitation (primarily physical therapy), including pain control, specific light physical activity, core muscle strengthening and functional muscle training therapy supporting the muscles around his spine. Before starting the training: we applied physical therapy treatments: thermotherapy, fascia releasing, Kinesio Tex Tape, core muscle training. After the training: we applied different physical therapy treatments: ice pack, stretching, sport



massage, especially on the low back area, low back traction, electrical stimulation, Kinesio Tex Tape, if needed. Then we examined his motoric function and intensity of his pain, including range of motion (ROM), pain control scale from 1-10, and Oswestry Low Back Pain Disability Questionnaire.

### **Results:**

Before the rehabilitation therapy, his pain scale ranged from 3-4 before training and 8-9 after training. After three months of rehabilitation we repeated the measurements and found that before training he was pain free (pain scale: 0), but he still had some feelings in his tight muscles, whereas after training his pain score ranged 3-4. There was a substantial improvement in the range of motion of the spine. Front bend of lumber spine was 20 degrees before and 45 degrees after rehabilitation, improving 25 degrees. Also, back bend of lumber spine was 15 degrees, which increase to 30 degrees, an improvement of 15 degrees.

### **Conclusions:**

Athlete-specific exercise rehabilitation therapy can substantially reduce the lumbar pain and range of motion in case of herniated intervertebral disc (diagnosed by MRI). Ongoing inquiring and discussion during his treatment was essential for both the gymnast and the coach, promoting successful rehabilitation, and continuing his training and sport competition.

**Keywords:** sport injury, physical therapy, gymnasts, low back pain, education of core muscle use

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## **Viktória Horváth**

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Budapest, Hungary**

Supervisor: Dr. György Bárdos PhD, DSc, full professor

## **Health promotion program for university students**

### **Introduction**

As several study cases show, the lifestyle of the university students can hardly be described as healthy in average. This is unfortunate since from some studies we know that a lot of them would like to know more about healthy lifestyle and would be willing to take actual steps to improve their own health if they would get education, information and help to do it. I believe in the opportunities in the higher education, and I believe that those who have the

knowledge and the opportunities have to make steps to provide information and help to reach a healthier lifestyle among university students.

### **Purpose of study**

So that is why I wanted to create a program which can provide them all the information they need to live a healthier but still enjoyable life. The program does not give exact instructions about what to eat, what sports to practice and what to do. It gives all the required information for them to be able to decide what develops and what destroys their own health. It gives them the ability to make good choices and decisions in the future.

### **Methods**

Here comes how to reach this goal: via interactive presentations and workshops about human physiology, eating habits, sports, sexual health, mental health, facts and misconceptions, best practices – in a way that they can get a clear picture about how the human body works and what they can do to support and take care of it. The next elements are the different types of sport lessons: different kinds of own body weight trainings, aerobics, gymnastics and yoga so that they can learn how to train anywhere without equipment. During the sport lessons the trainers provide information about how the exercises can be implemented appropriately and what effects do they have. But the key element of the program is to create a community and friendships among the participants. The appropriate platform for this aim is a private group on social media platforms where they can share photos, motivate each other, discuss different topics and socialize.

### **Results**

We have arranged a half semester trial version of the program in September 2017 with a small group of university students (7 people) so that we can learn every detail in practice how the program could be perfect and arranged with a larger number of students. I can say that we achieved 100% success because all the participants lives now a much healthier lifestyle and we learned key elements of an effective health promotion program. In 2018 September the well-built program will be initiated with the capacity of maximum 50 students with the contribution of our sport club (BEAC) and the Student Union of ELTE.

### **Conclusions**

In conclusion we are at the beginning of building a healthy and well-balanced community among university students and in the future I would like to do everything to build it as big as it is possible, but only until it can preserve the best possible quality. Although we won't be able to include every student at the universities successfully into these kinds of programs, but we have to provide help for those who want it.

**Keywords:** health promotion program, university students, healthy lifestyle, health and well-being, healthier university students

## **Zita Domonkos**

**István Széchenyi University Health-and Sportscience Faculty, Győr**

Supervisor: Dr. Ferenc Ihász

### Psychometric characteristics of body imaging in consideration of satisfaction and self-esteem

Body image is a subjective „picture” that people have their own body, regardless of how their body actually looks. [Cash TF, Pruzinsky TE. (1990), Menzel JE, at. al., (2011) Smolak L., (2011)., Schilder P. (2013)]. Negativ body image is expressed in one or more of the components of body image and is often characterised by a dissatisfaction with appearance and engaging in behaviours such as frequent self-weighing or mirror checking, or avoidance of public situations .

#### **Measured people, factors**

The whole sample ( $n_o=253$ ) person, ( $n_f=73$ ) male; ( $30.02\pm 10.17$ ) and ( $n_n=179$ ) were female, ( $29.75\pm 10.42$ ) years old, whose are were measured from Győr, Hungary. We measured their body components “InBody720” (Biospace Co. Inc., Seoul, South Korea) with Bioelektrical Impedancia method. we asked subjective factors with “*Body Shape Questionnaire*”, Cooper, P., at al., (1987) and the “*Rosenberg Self-esteem Scale*”, Rosenberg, (1965) scale.

#### **Results**

The difference between the age groups were significant. Regardless of the relative body fat average age from (1) [ $28.57 \pm 8.67$  - age (2)  $30.08 \pm 8:04$  - age (3)  $34.15 \pm 9:03$ ];  $p < 0.0003$  is not significant. The measured (MTTs) and the required body weight average (kTTS) during their life shows more difference (-10kg). The Body Shape Questionnaire (BSQ) with the exception of the answers given (BSQ 3,7,9,11) show a significant gender difference. Between age groups was no statistic difference.

#### **Conclusion**

Dissatisfaction with body image during our life is significantly, independent of gender. This fact in itself, and together even some measurable physical form a significant impact on satisfaction and self-esteem.

## Dear Speakers!

Congratulations on the acceptance of your abstract for presentation at the 23<sup>rd</sup> International Student Congress on Sport Sciences organized at the University of Physical Education, Budapest, Hungary.

As in the past, excellent lectures and talks will be presented at the Congress. The oral presentations will be held in the first floor of the Main Building, in Ferenc Hepp Lecture Hall and in Room 37 (on the right side of the corridor), whereas the coffee breaks and lunch will take place in Room 42/43 (back of Hepp Hall).

I hope that in addition to your own talk, you will be listening to the presentations of others and will be engaged in the discussions. However this can only happen if all of you keep the time allocated to your talk.

### Other information:

1. Please hand over the presentation on pen drive to the technical person before the start of your session or during the breaks.
2. Keep the scheduled time as indicated in the program.
3. Please make all your slides readable! Use at least font size 24 or greater. Do not put 4 figures on one slide. If it cannot be seen well, do not show it! Please, present primarily your own work and avoid showing complex summary figures taken from review papers.
4. The scientific committee will evaluate the abstracts and presentations and will select the best ones for Awards, which will be handed over at the end of the Congress.

Again, thank you for coming! In behalf of the scientific committee I wish you a successful conference.



Akos Koller  
President, Student's Scientific Association  
University of Physical Education, Budapest, Hungary







It is our great pleasure to inform you that in next year - in 2019 - the University of Physical Education will organize the section of Sports Science and Physical Education of the 34th National Student's Scientific Congress.

The new campus of our university will provide the venue for this great event! Be there!

