



THE ATHENS INSTITUTE FOR EDUCATION AND RESEARCH

# Abstract Book

14<sup>th</sup> Annual International Conference on  
**Kinesiology & Exercise Sciences**  
30 July - 2 August 2018, Athens, Greece

Edited by  
Gregory T. Papanikos

2018



Abstracts  
14<sup>th</sup> Annual International  
Conference on  
Kinesiology & Exercise  
Sciences

30 July – 2 August 2018

Athens, Greece

Edited by Gregory T. Papanikos

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## Preface

This book includes the abstracts of all the papers presented at the 14<sup>th</sup> *Annual International Conference on Kinesiology & Exercise Sciences (30 July - 2 August 2018)*, organized by the Athens Institute for Education and Research (ATINER).

In total 14 papers were submitted by 15 presenters, coming from 10 different countries (Bosnia and Herzegovina, Bulgaria, China, Israel, Italy, Jordan, Poland, Russia, South Africa, Taiwan). The conference was organized into 7 sessions that included a variety of topic areas such as Exercise and Rehabilitation, Training, Advances in Physical Education, Exercise and Cognitive Function, Exercise Training, Treatment Methods, and more. A full conference program can be found before the relevant abstracts. In accordance with ATINER's Publication Policy, the papers presented during this conference will be considered for inclusion in one of ATINER's many publications.

The purpose of this abstract book is to provide members of ATINER and other academics around the world with a resource through which to discover colleagues and additional research relevant to their own work. This purpose is in congruence with the overall mission of the association. ATINER was established in 1995 as an independent academic organization with the mission to become a forum where academics and researchers from all over the world could meet to exchange ideas on their research and consider the future developments of their fields of study.

It is our hope that through ATINER's conferences and publications, Athens will become a place where academics and researchers from all over the world regularly meet to discuss the developments of their discipline and present their work. Since 1995, ATINER has organized more than 400 international conferences and has published nearly 200 books. Academically, the institute is organized into seven research divisions and 37 research units. Each research unit organizes at least one annual conference and undertakes various small and large research projects.

For each of these events, the involvement of multiple parties is crucial. I would like to thank all the participants, the members of the organizing and academic committees, and most importantly the administration staff of ATINER for putting this conference and its subsequent publications together. Specific individuals are listed on the following page.

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

**14<sup>th</sup> Annual International Conference on Kinesiology &  
Exercise Sciences  
30 July - 2 August 2018, Athens, Greece  
Organizing and Academic Committee**

ATINER's conferences are small events which serve the mission of the association under the guidance of its Academic Committee which sets the policies. In addition, each conference has its own academic committee. Members of the committee include all those who have evaluated the abstract-paper submissions and have chaired the sessions of the conference. The members of the **academic committee** of the 14<sup>th</sup> Annual International Conference on Kinesiology & Exercise Sciences were the following:

1. Gregory T. Papanikos, President, ATINER.
2. Maria Konstantaki, Head, Sport, Exercise, & Kinesiology Unit, ATINER & Senior Lecturer, Buckinghamshire New University, UK.
3. Cleopatra Veloutsou, Professor, University of Glasgow, U.K.
4. Maria Rosaria D'Acierno, Academic Member, ATINER & Associate Professor, Università degli Studi di Napoli "Parthenope", Italy.
5. Aleksandra Zebrowska, Professor, Academy of Physical Education, Poland.
6. Majed Mujalli, Associate Professor, University of Jordan, Jordan.
7. Arcady Putilov, Chief Researcher, Head of Independent Research Group for Math-Modeling of Biomedical Systems, Research Institute for Molecular Biology and Biophysics (Novosibirsk), Russia.
8. Margo Apostolos, Academic Member, ATINER & Associate Professor, University of Southern California -USC Kaufman School of Dance-USC Gloria Kaufman Dance Medicine Center-& Co-Director-Cedars-Sinai, USA.
9. Nicola Lamberti, Postdoctoral Research Assistant, University of Ferrara, Italy.

The **organizing committee** of the conference included the following:

1. Fani Balaska, Researcher, ATINER.
2. Olga Gkounta, Researcher, ATINER.
3. Despina Katzoli, Researcher, ATINER.
4. Konstantinos Manolidis, Administrator, ATINER.
5. Kostas Spyropoulos, Administrator, ATINER.



**FINAL CONFERENCE PROGRAM**  
**14<sup>th</sup> Annual International Conference on Kinesiology & Exercise**  
**Sciences, 30 July - 2 August 2018, Athens, Greece**

**PROGRAM**

Conference Venue: Titania Hotel, 52 Panepistimiou Street, 10678 Athens, Greece

**Monday 30 July 2018**

**08:00-09:00 Registration and Refreshments**

**09:00-09:30 Welcome and Opening Address (Room C - 10<sup>th</sup> Floor)**

**Gregory T. Papanikos, President, ATINER.**

**09:30-11:00 Session I (Room A - 10<sup>th</sup> Floor): Exercise and Rehabilitation**

**Chair:** Maria Konstantaki, Head, Sport, Exercise, & Kinesiology Unit, ATINER & Senior Lecturer, Buckinghamshire New University, UK.

1. Aleksandra Zebrowska, Professor, Academy of Physical Education, Poland. Combining Hypoxic Methods and Interval Training for Peak Performance in Athletes.
2. Arcady Putilov, Chief Researcher, Head of Independent Research Group for Math-Modeling of Biomedical Systems, Research Institute for Molecular Biology and Biophysics (Novosibirsk), Russia. The Role of Sleep Deprivation Followed by Physical Exercise in the Battle against Depression.
3. Nicola Lamberti, Postdoctoral Research Assistant, University of Ferrara, Italy & Fabio Manfredini, Associate Professor, University of Ferrara, Italy. Near Infrared Spectroscopy as a Valid Tool to Support the Exercise Physiologist Interventions in Chronic Diseases.

**11:00-12:30 Session II (Room A - 10<sup>th</sup> Floor): Training**

**Chair:** Arcady Putilov, Chief Researcher, Head of Independent Research Group for Math-Modeling of Biomedical Systems, Research Institute for Molecular Biology and Biophysics (Novosibirsk), Russia.

1. Chi-Yao Chang, PhD, National Taiwan Sport University, Taiwan, Kuo-Chuan Lin, Assistant Professor, Chung Yuan Christian University, Taiwan, Min-Hao Hung, PhD, National Taiwan Sport University, Taiwan & Chin-Shan Ho, Associate Professor, National Taiwan Sport University, Taiwan. Different Inertia Resistance Training on the Performance of the Biceps.
2. Min-Hao Hung, PhD, National Taiwan Sport University, Taiwan, Kuo-Chuan Lin, Assistant Professor, Chung Yuan Christian University, Taiwan, Chi-Yao Chang, PhD, National Taiwan Sport University, Taiwan & Chin-Shan Ho, Associate Professor, National Taiwan Sport University, Taiwan. The Applications of Landing Strategies in Badminton Footwork Training on Backhand Side Lateral Jump Smash under Different Condition.

**12:30-14:00 Session III (Room A - 10<sup>th</sup> Floor): Advances in Physical Education**

**Chair:** Aleksandra Zebrowska, Professor, Academy of Physical Education, Poland.

1. Dina Tsybulsky, Senior Lecturer, Kibbutzim College, Israel. Team-Teaching in the Science Classroom: A Study of Student-Teachers' Experiences.
2. Mari Van Wyk, Lecturer, University of KwaZulu-Natal, South Africa. Exploring Pre-Service Teachers' Reflective Practice: A Case Study.
3. Marco Mazzocca, PhD Student, University of Padua, Italy, Paolo Sommaggio, Associate Professor, University of Trento, Italy & Alessia Schiavon, PhD Student, University of Padua, Italy. From Teaching to Training. Remarks on Two Possible Models of Social Enhancement.

**14:00-15:00 Lunch**

**15:00-16:30 Session IV (Room A - 10<sup>th</sup> Floor): Exercise and Cognitive Function**

**Chair:** Majed Mujalli, Associate Professor, University of Jordan, Jordan.

1. Maria Rosaria D'Acerno, Associate Professor, Università degli Studi di Napoli "Parthenope", Italy. Physical Education between Bodily Health and Cognitive Growth for Young Children (age 3 to 5).
2. Vessela Slavova, Assistant Professor, Bulgarian National Sports Academy, Bulgaria, Nely Yankova, Associate Professor, Bulgarian National Sports Academy, Bulgaria & Valentin Panayotov, Associate Professor, Bulgarian National Sports Academy, Bulgaria. Study of the Attitude of Weightlifters towards the Use of New Technologies in Sports Training and Education.
3. Sha Ge, Instructor, Tianjin Normal University, China, Xin Tian, Professor, Tianjin Normal University, China, Chao Song, Assistant Professor, Tianjin Normal University, China, Zenong Yin, Professor, The University of Texas at San Antonio, USA, William Land, Assistant Professor, The University of Texas at San Antonio, USA & Wan X., Yao, Professor, The University of Texas at San Antonio, USA. Time Course Changes in Brain Activities during pre-Competitive Training: A Case Study on an Olympic Champion in Race Walking.

**16:30-18:30 Session V (Room C - 10<sup>th</sup> Floor): ATINER's 2018 Series of Academic Dialogues: A Symposium on the Future of Teaching and Researching in a Global World**

**Chair:** Cleopatra Veloutsou, Professor, University of Glasgow, U.K.

1. Ken Roberts, Emeritus Professor, School of Sociology and Social Policy, University of Liverpool, U.K. Massification and Stratification of Tertiary Education.
2. Alexis Smith Macklin, Dean, Purdue University, Fort Wayne, USA. Going Global in Higher Education: The Importance of Innovation, Connection, and Reflection in a Networked Learning Environment.
3. Maria Rosaria D'Acerno, Associate Professor, University degli Studi di Napoli "Parthenope", Italy. Research and Teaching are no more Isolated Issues.
4. Husam Arman, Associate Research Specialist, Kuwait Institute for Scientific Research, Kuwait. The Dynamics of Education and Research in the Fourth Industrial Revolution.
5. Joern Redler, Professor, Mainz University of Applied Sciences, Germany. Some Questionable Developments in Germany's Management and Marketing Degree Programs.
6. Ulf Johansson, Professor, Lund University, Sweden. From Providing Toolset to Working with Mindset: The Future of Teaching and Researching Management in a Global World.

**21:00-23:00 Greek Night and Dinner**

**Tuesday 31 July 2018**

**07:45-10:45 Session VI: An Educational Urban Walk in Modern and Ancient Athens**

**Chair:** Gregory A. Katsas, Vice President of Academic Affairs, ATINER & Associate Professor, The American College of Greece-Deree College, Greece.

Group Discussion on Ancient and Modern Athens.  
Visit to the Most Important Historical and Cultural Monuments of the City (be prepared to walk and talk as in the ancient peripatetic school of Aristotle)

**11:00-13:00 Session VII (Room A - 10<sup>th</sup> Floor): Exercise Training and Treatment Methods**

**Chair:** Nicola Lamberti, Postdoctoral Research Assistant, University of Ferrara, Italy.

1. Kuo-Chuan Lin, Assistant Professor, Chung Yuan Christian University, Taiwan, Ke-Chou Chen, Assistant Professor, Chung Yuan Christian University, Taiwan, Min-Hao Hung, PhD, National Taiwan Sport University, Taiwan, Chi-Yao Chang, PhD, National Taiwan Sport University, Taiwan & Chien-Chia Jung, Assistant Professor, Chung Yuan Christian University, Taiwan. The Effects of Whole-Body Vibration Exercise on Blocking Skill-Related Performances of Volleyball Players.
2. Goran Pasic, Assistant Professor, University of Banja Luka, Bosnia and Herzegovina, Goran Grahovac, Associate Professor, University of Banja Luka, Bosnia and Herzegovina & Mihajlo Mijanovic, Professor, University of Banja Luka, Bosnia and Herzegovina. The Differences and the Dynamics of Swimming Development in the Area of Europe and Bosnia and Herzegovina.
3. Majed Mujalli, Associate Professor, University of Jordan, Jordan & Alaa Abu Aloyoun, Associate Professor, University of Jordan, Jordan. The Effect of Different Methods of Treatment for Patients with Lumbar Herniated Disc.

**13:00-14:00 Lunch**

**20:00- 21:30 Dinner**

**Wednesday 1 August 2018**  
**Mycenae and Island of Poros Visit**  
**Educational Island Tour**

**Thursday 2 August 2018**  
**Delphi Visit**

**Friday 3 August 2018**  
**Ancient Corinth and Cape Sounion**

**Chi-Yao Chang**

PhD, National Taiwan Sport University, Taiwan

**Kuo-Chuan Lin**

Assistant Professor, Chung Yuan Christian University, Taiwan

**Min-Hao Hung**

PhD, National Taiwan Sport University, Taiwan

&

**Chin-Shan Ho**

Associate Professor, National Taiwan Sport University, Taiwan

## **Different Inertia Resistance Training on the Performance of the Biceps**

**Background:** In recent, resistance training has been widely used to improve physical capacities such as strength, agility, and power. The resistance training quantifies the weight in the linear guides, allowing the neuromuscular to adaptation to the load.

**Purpose:** Through this study, dynamic inertia resistance training was used to generate a faster velocity during concentric phase and accumulate more angular momentum during eccentric contraction. Muscle contraction speed and strength curve, combines rapid action and inertia, resulting in eccentric contraction intensity.

**Methods:** Eight men were recruited as subjects, use spontaneous of magnetron inertial resistance training machine for biceps to extension and flexion movement. Data were collected via Electromyography (EMG), load cells and electrogoniometer, analyzed action during for EMG (maximum (max) and mean), maximum force (MF), and range of motion (ROM). Compare adjustable and fixed in concentric and eccentric phases, a total of four groups (adjustable resistance concentric (ARC), adjustable resistance eccentric (ARE), fixed resistance concentric (FRC) and fixed resistance eccentric (FRE)).

**Results:** The results show that MF:ARC is greater than ARE is greater than FRC, and ARC is greater than FRE. EMG Max: Both ARC and FRC are greater than ARE and FRE. EMG mean: ARC is greater than other groups. ROM: ARC and ARE are greater than FRC and FRE. Percentage of action time: FRC segment is greater than ARC, FRE is less than all groups.

**Conclusion:** Inertial resistance training due to moment of inertia, It is used to produce faster speeds during concentric phases and accumulate more angular momentum during eccentric contractions.

**Maria Rosaria D’Acierno**

Associate Professor, Università degli Studi di Napoli “Parthenope”, Italy

### **Physical Education between Bodily Health and Cognitive Growth for Young Children (ages 3 to 5)**

This research wants to point out that movement is the main resort children have to prepare their body and their mind for an active future lifestyle. An active life stimulates children not only on the physical side, but on the cognitive level, too (Etnier and Sibley, 2003). It has been proved that when children have enough exercises their mind becomes more receptive, and even their curiosity seems to improve. As a consequence, children at kindergarten should have at least 30 minutes a day of physical activities, employing not only formal gymnastics but moreover games, so the whole body as well as the brain are involved (Booth and Chakravarthy, 2005). In doing so, they develop enough strength to use hands, fingers, arms, legs in order to coordinate physical movements with eyes movements. This exercise will drive them to pursue their aim according to the group they belong to. They learn important skills while their brain either controls or commands their body.

Physical education as part of academic education provides opportunities for all children to exhibit a more positive attitude towards school in general and the learning of school subjects in particular (Sallis et al. 1999). While learning how their body works and what their body needs children become conscious about how to maintain a healthy body. As the name – physical education – suggests, children are educated to exploit their potential, so to be able to command their body. Furthermore, while practicing physical exercises children come across the notion of space and time in relation to their body. In fact, they have to measure the space in which their body will move, and they have also to follow a precise time according to the rhythm of the music which will direct their movements. This is a very important stage for young children who learn how to control their body while familiarizing with it.

New recent trends associate, even for very young children, gymnastic with nutrition, thus stimulating them to accept a diet rich in fruit and vegetables (*Health United States*, 2005). In brief, physical activity, by emphasizing locomotor, non-locomotor and manipulative skills, becomes an important venue for the social, psychological and emotional developments of children (Lonsdale et al. 2013). They learn how to move their body, how to coordinate their movements in relation to others, but most importantly, how to follow the teacher’s instructions in connection with the group (Siedentop 2009).

**Sha Ge**

Instructor, Tianjin Normal University, China

**Xin Tian**

Professor, Tianjin Normal University, China

**Chao Song**

Assistant Professor, Tianjin Normal University, China

**Zenong Yin**

Professor, The University of Texas at San Antonio, USA

**William Land**

Assistant Professor, The University of Texas at San Antonio, USA

&

**Wan X. Yao**

Professor, The University of Texas at San Antonio, USA

### **Time Course Changes in Brain Activities during pre-Competitive Training: A Case Study on an Olympic Champion in Race Walking**

There is a consensus in the sport-training field that elite athletes require a well-designed training cycle in order to perform optimally during competition. The characteristics of elite athletes' physiological responses across the time course leading up to competition have been well documented. However, there is little if any research that has been done on changes in brain activities before and immediately prior to competition. Therefore, the purpose of the present study was to determine pre-competitive changes in brain activities during early training (five months before the Olympic Games) and immediately prior (one month before) to competition in an elite race-walking athlete.

A case study was conducted with one world-level race walker who achieved a gold medal during the 2016 Olympic Games in Brazil. The study required the athlete to watch a two-minute race walking video of himself while imagining the emotions he felt during the event. The task was conducted twice: once five months prior to the Olympic Games and the second one month before the Olympic Games. Brain activities were monitored and obtained by using a continuous wave fNIRS system (LABNIRS/16, Shimadzu Corporation, Kyoto, Japan), using three different wavelengths ( $780 \pm 5$  nm,  $805 \pm 5$  nm,  $830 \pm 5$  nm), sampling at 11 Hz, converting the changes in optical density into changes in HbO and HbR by using the Modified Beer-Lambert Law. Near infrared light was delivered via fiber optic cables that terminated in a 4 x 7 multichannel plastic headgear. The headgear contained 14 sources and 14 detectors approximately 3 cm apart, creating a total of 45 channels. The headgear was positioned on the head following the 10-20 international system so that the center of the

headgear was aligned with the vertex (Cz) and lateral channels covered the area around the C3 and C4 landmarks.

For the purpose of the study, only four major cortices in both hemispheres were analyzed, namely primary motor cortex (M1), premotor cortex (PMC), supplementary motor area (SMA), and primary somatosensory cortex (S1). Findings from the current study show that the intensity of brain activities as measured by an increase in HbO immediately prior to competition was significantly higher than during the early training period across all measured cortical areas. The differences in the intensity of brain activities across the time course of training are more obvious in PMC and SMA areas than in M1 and S1 areas. The current study suggests that the readiness of the neural-control system is much greater immediately prior to competition than during earlier periods of training, which is consistent with the previous literature on the physiological changes leading up to competition.

**Min-Hao Hung**

PhD, National Taiwan Sport University, Taiwan,

**Kuo-Chuan Lin**

Assistant Professor, Chung Yuan Christian University, Taiwan

**Chi-Yao Chang**

PhD, National Taiwan Sport University, Taiwan

&

**Chin-Shan Ho**

Associate Professor, National Taiwan Sport University, Taiwan

### **The Applications of Landing Strategies in Badminton Footwork Training on Backhand Side Lateral Jump Smash under Different Condition**

Badminton is a high-intensity sport. Badminton specific movements, such as the landing after a backhand stroke at the backcourt, would cause higher loading of the lower limb joints, lower limb injuries in badminton players have been found in statistical studies. Footwork training is an important factor for joint loading during landing. However, few studies have compared the effects of different footwork training with diverse types of badminton strokes. This research investigated the influences of different smash footwork movement training in badminton players. Sixteen elite badminton players with mean badminton experience of  $10.5 \pm 2.4$  years performed. Three footwork training were provided: the footwork condition (racket swinging), target condition (hung target striking), and smash condition (badminton stroke). One-way repeated measures ANOVA with the Bonferroni correction was used to compare the differences among the three conditions. At the initial contact of the landing phase, the difference in center of mass (COM) velocity was non-significant among the three conditions. The range of knee flexion was significantly higher in the smash condition than in target and footwork conditions. Significantly higher means of the knee valgus angle were found in the smash condition than in the target and footwork conditions. The range of hip abduction was significantly higher during the smash condition than during the target and footwork conditions. The maximum flexion angle of the knee joints was greater in the smash and target conditions than in the footwork condition. Greater frontal plane motion occurred during strokes, which produced higher loading of the lower limb joints.



**Nicola Lamberti**

Postdoctoral Research Assistant, University of Ferrara, Italy

&

**Fabio Manfredini**

Associate Professor, University of Ferrara, Italy

## **Near Infrared Spectroscopy as a Valid Tool to Support the Exercise Physiologist Interventions in Chronic Diseases**

Near Infrared Spectroscopy (NIRS) is a noninvasive technology, suitable for static or dynamic measurements of muscle performance during motor tasks. It is relatively inexpensive, simple and easy to learn. The injection of near infrared light in the in human body tissues and the analysis of the residual light signal detected by the receiving probes, allows the measurement of relative changes in oxy-hemoglobin and deoxy-hemoglobin concentration, in localized regions of tissue perfused by arterioles, venules and capillaries. The objective assessment of changes of regional skeletal muscle blood flow and oxygenation allows studying the mismatch between oxygen delivery and demand in muscle tissue in patients with vascular diseases. These features make the NIRS technique potentially useful in a vascular laboratory testing for monitoring oxygen availability and its utilization.

In the last years, our research group has applied the NIRS technology on chronic diseases under static and dynamic conditions to assess parameters correlated to the clinical and functional status.

At rest, the muscle oxygen consumption at calf in peripheral arterial disease, end-stage renal disease, multiple sclerosis and stroke survivors was measured [1-3]. In all of these patients, unexpected higher values of oxygen consumption compared to healthy controls were observed, suggesting the hypothesis that the parameter could represent a biomarker of muscle deconditioning. This hypothesis was strengthened by the reversibility of that condition, with re-normalized values observed after specific exercise-training programs [3,4].

Secondly, NIRS was employed to support functional tests in peripheral arterial disease patients. A dynamic objective test assisted by NIRS was validated to objectively quantify the degree of oxygen debt in patients' calves during an incremental walking test at treadmill, by the calculation of the area-under-curve of oxyhemoglobin trace [5]. The values obtained were also studied in patients with or without diabetes, to determine the reliability of claudication symptoms in presence of peripheral neuropathy [6].

Moreover, recently a toe-flexion test to measure the deoxygenation of muscles of the dorsum of the foot was proposed, to assess the perfusion of the distal part of the foot, particularly in presence of microvascular impairment [7].

All of these measures supported by NIRS could be employed to evaluate the effectiveness of exercise and rehabilitation programs [3,4], pharmacological or surgical treatments, and of medical devices [8]. Finally, the dissemination of the methodological aspects of NIRS and of the experiences in its utilization collected by our research group, could be of potential interest in the fields of exercise therapy and rehabilitation of chronic diseases.

**Kuo-Chuan Lin**

Assistant Professor, Chung Yuan Christian University, Taiwan

**Ke-Chou Chen**

Assistant Professor, Chung Yuan Christian University, Taiwan

**Min-Hao Hung**

PhD, National Taiwan Sport University, Taiwan

**Chi-Yao Chang**

PhD, National Taiwan Sport University, Taiwan

&

**Chien-Chia Jung**

Assistant Professor, Chung Yuan Christian University, Taiwan

### **The Effects of Whole-Body Vibration Exercise on Blocking Skill-Related Performances of Volleyball Players**

The volleyball is a sport which require with high demand physical capabilities including agility, speed and power. The whole-body vibration exercise has become a popular method to apply into sport and improve the performance for the athletics. The study aimed to evaluate the effects of vibration stimulation on blocking skill-related performances of male volleyball players on blocking condition. A total of twenty elite male college volleyball players were recruited in this study. The whole-body vibration (WBV) exercise consisted of 60s, with 28 Hz frequencies and 10mm amplitudes was applied into the subject. The blocking skill-related tests were consisted with counter movement jump (CMJ), blocking agility test (BAT), agility T-test (AT) and 10 meters sprinting (10MS). All the participants were required to perform before (pre-test) WVB program, immediately after the WVB program (post 0s), 60s after the end of the program (post 60s), and 120s after the end of the program (post 120s). The peak power output (PPO), mean force (MF), maximum rate of force development (mRFD) and relative net impulse (RNI) from the CMJs were calculated. Data were analyzed using repeated measures ANOVA was used with condition as the primary factor and time (pre-test, post 0s, post 60s, and post 120s) as the nested within subjects factor. The main results indicated that the BAT in post 60s and post 120s were significant superior than pre-test and post 0s. In addition, the mRFD and RNI were significant improved in post 60s, and post 120s. The results of this study suggest that the adaptation of the neuromuscular system might be the primary factor resulting from the tonic vibration reflex and increasing of muscle activity.

**Marco Mazzocca**

PhD Student, University of Padua, Italy

**Paolo Sommaggio**

Associate Professor, University of Trento, Italy

&

**Alessia Schiavon**

PhD Student, University of Padua, Italy

**From Teaching to Training. Remarks on Two Possible Models  
of Social Enhancement**

**Majed Mujalli**

Associate Professor, University of Jordan, Jordan

&

**Alaa Abu Aloyoun**

Associate Professor, University of Jordan, Jordan

### **The Effect of Different Methods of Treatment for Patients with Lumbar Herniated Disc**

The aim of this study was to investigate the impact of the supposed therapeutic program – using massage, ultrasound, therapeutic exercises, and Traction- to decrease the degree of lumbar disk herniation. And improve back's strength, legs strength, and back flexibility. Also, decrease pain. Systematic review with meta-analysis of randomized trials on (34) patients with lumbar disc herniation, with an age average (46.42) years, and the height average (167.32) cm, and the weight average (69.06) kg. The program was applied over 8 weeks by (25) therapeutic sessions, and it follow-up for two months. Was used the magnetic resonance imaging (MRI) to determine the degree of herniated disc, Dynamometer for muscles strength, Inclinometer for flexibility, and VAS for pain. The results showed a statistically significant difference between the two measurements pre- and post to all patients. Conclusion: patients with lumbar disc herniation can benefit from the supposed therapeutic program to decrease the degree of herniated disc which led to improve their health.

**Goran Pasic**

Assistant Professor, University of Banja Luka, Bosnia and Herzegovina

**Goran Grahovac**

Associate Professor, University of Banja Luka, Bosnia and Herzegovina

&

**Mihajlo Mijanovic**

Professor, University of Banja Luka, Bosnia and Herzegovina

**The Differences and the Dynamics of Swimming  
Development in the Area of Europe and Bosnia and  
Herzegovina**

**The Subject and the Problem of Research**

The subject of research is swimming in Bosnia and Herzegovina from 2008 to 2016. The problem of research is the trend of swimming development in Europe and Bosnia and Herzegovina in the period from 2008 to 2016.

**Aim of Research**

The primary aims of research are: 1. to determine the trend of swimming development in Europe and B&H in the period from 2008 to 2016. 2. Based on optimal function of trend to assess the results for 2017. 3. to determine the differences between achieved results in Europe and B&H.

**The Sample of Participants and the Sample Variables**

Sample of examinees presents the participants of the final championships of Europe from 2008 to 2014 and the participants of the final race of important and official competitions that belongs to the territory of Bosnia and Herzegovina (hereafter B&H). The variable based on which the difference is determined between achieved results at the level of the swimmer Europe and B&H has been the 50m freestyle disciplines. It is matter about the male senior.

**Achieved Results**

- Functions of trend point out that there is a general improvement of results at each and other's swimmers.
- Linear Function trend for the swimmers from Europe is:  $Y_{(EVROPA)} = \underline{22.315} - 0.083 x$ .
- Linear Function trend for the swimmers from B&H is:  $Y_{(BIH)} = \underline{26.51} - 0.304 x$ .

- Evaluation of the results for 2017.  $Y_{(EUROPE)} = 22.232 \pm 0.064$  and for B&H  $Y_{(BIH)} = 26.206 \pm 0.109$

Based on parameters  $B_{(EUROPE)}=-0.083$  and  $b_{(B\&H)}=-0.304$ , ie. the value that indicates the size of the improved results during the observed period, it can be concluded that greater improvement already exists at the swimmers from B&H. However, it is not enough to reduce the differences recently, not only statistically but also essential. The standard error of the model is significantly higher at the athletes from B&H, that reduces the reliability of estimates for the next cycle.

Based on the Descriptive statistics and Analyzes of variance (ANOVA) can be concluded that there is a statistically significant difference between the swimmers from EUROPE and the swimmers from B&H.

**Table 1.** *Descriptive Statistics*

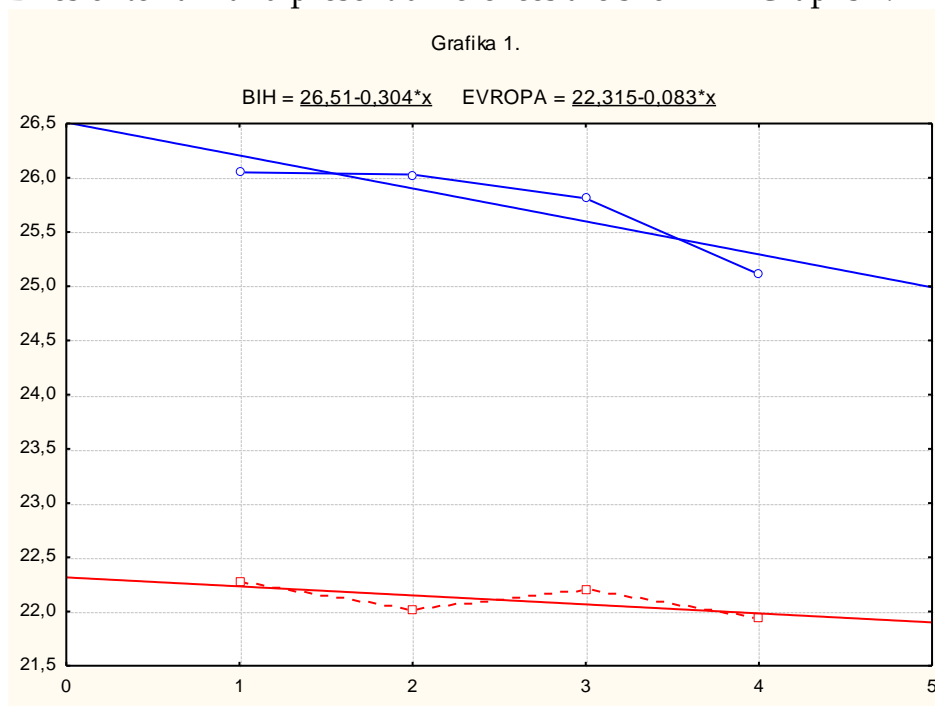
Age		N	Mean	Std. Dev	Std. Err	Lower Bound	Upper Bound	Min	Max
2008	BiH	8	26.0475	.97501	.34472	25.2324	26.8626	24.12	27.35
	Evropa	8	22.2800	.35741	.12636	21.9812	22.5788	21.66	22.75
2010	BiH	8	26.0338	1.13108	.39990	25.0881	26.9794	23.92	27.09
	Evropa	8	22.0062	.31866	.11266	21.7398	22.2727	21.49	22.38
2012	BiH	8	25.8050	.84248	.29786	25.1007	26.5093	23.83	26.67
	Evropa	8	22.1963	.23640	.08358	21.9986	22.3939	21.80	22.65
2014	BiH	8	25.1125	.60403	.21356	24.6075	25.6175	23.95	25.78
	Evropa	8	21.9400	.27381	.09681	21.7111	22.1689	21.31	22.14

**Table 2.** *ANOVA*

Age	Varijanse	Sum of Squares	df	Mean Square	F	Sig.
2008	Between Groups	56.776	1	56.776	105.298	.000
	Within Groups	7.549	14	.539		
	Total	64.325	15			
2010	Between Groups	64.883	1	64.883	93.973	.000
	Within Groups	9.666	14	.690		
	Total	74.549	15			
2012	Between Groups	52.092	1	52.092	136.072	.000
	Within Groups	5.360	14	.383		
	Total	57.452	15			
2014	Between Groups	40.259	1	40.259	183.070	.000
	Within Groups	3.079	14	.220		
	Total	43.338	15			

- The absolute differences of arithmetic means are shown in Table 1. Statistical significance is shown in the Table 2. (column *Sig.*).

- Lines of terrain and present differences are shown in Graphs 1.





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**The Role of Sleep Deprivation Followed by Physical Exercise in the Battle against Depression**

Depression is one of the most treatable mental disorders, and there are many treatment options now available for those suffering from depression. However, in order to manage the symptoms of depression, more than just taking medication is required. Physical exercise and sleep play a vital role in managing and preventing this condition. In a series of our previous one-week treatment trials, the most powerful treatment responses were shown by depressed patients to such non-pharmacological antidepressants as sleep deprivation (waking therapy) and physical exercising (kinesiotherapy). Since the antidepressant action of sleep deprivation is short lasting (e.g. it is often gone already after recovery sleep), physical exercise was used for stabilization of the initial antidepressant response to total sleep deprivation. In seasonal depression, such a combined treatment was found to be significantly more effective than the combination of sleep deprivation with afternoon intake of either melatonin or placebo, and, in non-seasonal depression, this treatment showed a significantly higher efficacy than the combination of sleep deprivation with bright light therapy. The results of our trials along with the review of the recent literature suggested that physical exercise is an effective but often underused treatment for mild to moderate depression. Moreover, the most recent experimental studies of animal models provided a plausible explanation of the neurophysiological mechanisms underlying the beneficial (e.g., mood enhancing) effects of sleep deprivation and physical exercises. However, the question of generalizability of these experimental findings to a clinical population remains unanswered. Fortunately, this question would be rather easily addressed in an experimental study of these neurophysiological mechanisms in the participants with mild to moderate depression since an experimental protocol consisting of sleep deprivation followed by physical exercise has been proven to reduce the depression level in the vast majority of such study participants.

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## **Study of the Attitude of Weightlifters towards the Use of New Technologies in Sports Training and Education**

**Introduction:** In recent years the dissemination of digital technologies among young people has been steadily increasing. The participants of our research were young people, part of the contemporary “digital generation”, whose sports training practices should be enhanced via the use of new technologies.

**Aim:** The aim of the study was to assess the attitude of competitive young weightlifters towards the use of digital technologies in the process of sports training and education.

**Methods:** We surveyed 35 respondents, 15 of which were active weightlifters aged between 10 and 20 years and the other 20 were coaches and students at the National Sports Academy of Bulgaria aged between 20 and 45 years.

**Results:** The analysis of the results showed that the level of proficiency in using new technologies for physical education and sports training of the study subjects was comparatively low. The participants demonstrated a markedly positive attitude towards the use of new technologies in sports training despite their lack of previous experience in the field.

**Conclusion:** The main advantages of using new technologies in sports training are i) better illustration of the most basic technics of the sport, ii) easy access to video resources, and iii) attractiveness and innovative sports training.

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**Team-Teaching in the Science Classroom:  
A Study of Student-Teachers' Experiences**

**Mari Van Wyk**

Lecturer, University of KwaZulu-Natal, South Africa

**Exploring Pre-Service Teachers' Reflective Practice:  
A Case Study**

**Aleksandra Zebrowska**

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## **Combining Hypoxic Methods and Interval Training for Peak Performance in Athletes**

### **Introduction**

Intermittent hypoxic exposure with exercise training is commonly used to increase muscle oxidative capacity and exercise performance. The physiological responses to a lowered inspired oxygen pressure vary depending on whether they are mediated by barometric pressure reduction (hypobaric hypoxia) or by lowering the oxygen fraction (normobaric hypoxia). It has been indicated that interval training, with high-intensity hypoxic exercise bouts caused a significantly higher improvement in endurance performance compared to the same training protocols performed under normoxia conditions. Therefore, the aim of this study was to evaluate the effects of modified oxygen conditions during high intensity interval training on peak performance in endurance trained athletes.

### **Methods**

Twelve male endurance trained athletes (mean age:  $24.0 \pm 4.0$  years) were divided randomly into normoxic training (Nor Tr,  $FIO_2 = 20.9\%$ ) and hypoxic training (Hyp Tr  $FIO_2=15.2\%$ ). The training sessions were performed three times per week during three weeks of each training protocol and The Altitude Trainer, Hypoxico System (LOWOXYGEN System, Germany) was used during the training in hypoxia conditions. Before and after each training period, all athletes were subjected to an incremental exercise test under normoxia to determine their individual aerobic performance ( $VO_{2max}$ ), lactate threshold (LAT), peak power and selected neurotrophic and growth factors.

### **Results**

Hypoxic exposure has significant effect on peak performance and physiological responses to exercise.  $VO_{2max}$  increased after training under both oxygen conditions, significant increases ( $p<0.01$ ) were observed only in Hypo Tr ( $p < 0.01$ ). Maximal power (Pmax) was also higher in response to Hyp Tr compared Nor Tr ( $p<0.05$ ). Oxygen conditions had significant effects on hematological variables and growth factors (BDNF, IGF-1, VEGF) responsible for neuromuscular system function.

## **Conclusions**

High intensity interval training with normobaric hypoxia is based on the assumption that 3 weeks exposure to hypoxia is sufficient to increase exercise performance and induce beneficial adaptations of neuromuscular system.