

Kinesiology & Exercise Sciences

Abstract Book

From the 7th Annual International
Conference on Kinesiology & Exercise
Sciences, 27-30 June, 2011,
Athens, Greece.

Edited by Gregory T. Papanikos



THE ATHENS INSTITUTE FOR EDUCATION AND RESEARCH
2011

First Published in Athens, Greece by the Athens Institute for Education and Research.

ISBN: 978-960-9549-12-7

All rights reserved. No part of this publication may be reproduced, stored, retrieved system, or transmitted, in any form or by any means, without the written permission of the publisher, nor be otherwise circulated in any form of binding or cover.

8 Valaoritou Street
Kolonaki, 10671 Athens, Greece
www.atiner.gr

©Copyright 2011 by the Athens Institute for Education and Research. The individual essays remain the intellectual properties of the contributors.

TABLE OF CONTENTS

(In Alphabetical Order by Author)

Preface

Conference Program

1. **The Effect of Resveratrol Treatment and Caloric Restriction on Doxorubicin-Induced Toxicity in Aged Rat Skeletal Muscle**
Peter J. Adhihetty
2. **The Relationship between Perceived Motivational Climate and Self-Reported Effort/Persistence in Secondary Physical Education**
Bulent Agbuga, Sehmus Aslan, Yuksel Kepenek & Ugur Dunder
3. **Examining the Validity of the ActivPAL Monitor in Measuring Sitting and Ambulatory Movement in Children**
Saeideh Aminian & Erica Hinckson
4. **The Comparison between Exercising and Non-Exercising Individuals' Stress Levels**
Sehmus Aslan, Bulent Agbuga & Ahmet Alptekin
5. **Relationships between Single Leg Half Squat, Single Leg Decline Squat, and Anthropometric Characteristics of Young Adults**
Ummuhan Bas Aslan, Ugur Cavlak, Emre Baskan & Emine Aslan Telci
6. **Trends in Physical Activity in the U.S. before and during the Current Financial Crisis**
Peter Baltrus
7. **Aging and Exercise Training Reduce Testes Microvascular PO₂**
Brad Behnke & Peter Adhihetty
8. **Higher Levels of Leisure-time Physical Activity and Aerobic Fitness are related to Greater Vascular Endothelial Function Independent of Age and Sex**
Demetra D. Christou, Kerrie L. Moreau & Douglas R. Seals
9. **Processing of Visual Information Contributes to the Amplification of Motor Output Variability in Older Adults**
Evangelos Christou, H.S. Baweja, M.H. Kwon, D.M. Kennedy, Y.T. Chen & C. Kim
10. **Meta-Analysis of Older Adults' Health Outcomes from Supervised Exercise Interventions**
Vicki Conn
11. **Changes in IGF-I and Estrogen in Pre- and Post-Menopausal Women after an Ultra-Marathon**
Jennifer Copeland & M.L. Sophia Verzosa
12. **Sport, Music and Foreign Languages**
Maria Rosaria D'Acierno
13. **Creating an Environment Favourable to Learning: A Challenge for Health and Physical Education Student Teachers**
Jean-Francois Desbiens, Carlo Spallanzani, Martin Roy, Sylvain Turcotte, Severine Lanoue & Jean-Sebastien Tourigny
14. **The Effect of a Special Olympics Program on the Self Efficacy of Individuals with Down Syndrome**
Abdollah Ghasemi, M. Momeni, M. Falahati, A. Elahi & Leila Ghodrati
15. **Health Factors in Qatar and the Sport Science Program of Qatar University**
Ruben Tobias Goebel

16. **The Effect of Pilates on the Balance and Flexibility of the Figure Skaters**
Mine Gokkaya, V. Akbal, B. Meric Bingul, M. Aydin & C. Bulgan
17. **Twenty Four Hour Monitoring of Children's Habitual Activity Using the ActiPal Accelerometers**
Erica Hinckson, Will Hopkins, Saeideh Aminian & Kara Faithfull
18. **Efficacy of Evidence-Based Physical Activity within a Secure Juvenile Correctional Facility**
Dallas Jackson, Ron French, Terry Senne & David Nichols
19. **Differences in Body Composition and Prevalence for Postural Deviations in Girls from Two Racial Groups in South Africa**
Suzanne Jacobs & J. Hans De Ridder
20. **"Panoptic Differential Training: Biodynamics Approach for Sprint Performance" - A Wholistic Future Training Method**
Rajasekhar Kali Venkata
21. **Longitudinal Changes in Psychosocial Constructs and Physical Activity among Adults with Physical Disabilities**
Maria Kosma, Rebecca Ellis & Jeremy J. Bauer
22. **Taurine, a Nutrient Improving Motor Activity, Stimulates the Reverse Cholesterol Transport in Macrophages and Improves Lipid Metabolism in Vitro**
Sung-Joon Lee & Minh-Hien Hoang
23. **Effect of an Integrated Group Exercise Program on Functional Fitness, Health-related Quality of Life, and Exercise Behavior in Underserved Agricultural Community Older People**
Gladys Shuk-Fong Li & Amy Hsiu-Hua Wang
24. **Incidence and Severity of Competition Injuries in Australian Taekwondo Athletes**
Reidar Lystad, Petra I. Graham & Rod Bonello
25. **Physical Activity and Brain Aging**
Krisztina Marosi
26. **Accelerometer Measurement Issues in a Primary School Play Intervention**
Les McGrath, Erica Hinckson & Will Hopkins
27. **Exercise Promotes a Temperature Dependent Expression of Heat Shock Proteins in the Vasculature**
Earl Noble & Steven M. Wolff
28. **Perception of Working Women Regarding their Participation in Physical Activities**
Verena Nolan & Jhalukpreya Surujlal
29. **Three Dimensional Musculoskeletal Modelling of the Seated Biceps Curl Resistance Training Exercise**
Kim Nolte, Pieter E. Kruger & P. Shalk Els
30. **Physical Activity and Prevention: Effects of Selective Breeding for High Wheel Running Activity on Nutrition, Metabolism and Behaviour**
Csaba Nyakas
31. **Differences in Perception of Body Image and Associated Psychophysiological Variables between Male and Female Athletes**
Fabiana Pomin, Milagro Ezquerro & Itziar de Ozamiz
32. **A Method for Quantifying Sensori-motor Function Related to Age and Evaluating Effectiveness of Various Physical Exercises for Seniors**
Gongbing Shan & Xiang Zhang

- 33. Exercise Evaluation of Right Ventricle in Obesity – A Supine Exercise Echocardiographic and Radionuclide Study**
Cristina Maria Stanescu, Dan Stanescu, Vasile Manoliu, Kyriaki Branidou, G.H. Andrei Dan, Cristina Chirion, Claudio Stan, Anca Dan, Cristian Baicus
- 34. The Effect of Growth and Maturation on the Physical and Motor Abilities, as well as Rugby Skills of Early, Average and Late Developers: A Longitudinal Study**
Linda Van den Berg & Anita E. Pienaar
- 35. Pain Effect on Physical Activity Profiles of Hip Osteoarthritis Patients**
Vassilios Vardaxis & Laura Covill
- 36. Can a Tweet Make you Fit?**
Theodore Vickey
- 37. Effect of Exercise Training on Heat Shock Protein 72 Expression in the Brain of Type I Diabetic Rats**
Yu-Lei Wei & Ching-Hsia Hung
- 38. Building Brand Loyalty in the Fitness Industry**
Antonio Williams & Paul M. Pederson

Preface

This abstract book includes all the abstracts of the papers presented at the 7th Annual International Conference on Kinesiology & Exercise Sciences 27-30 June, 2011, organized by the Athens Institute for Education and Research. In total there were 38 papers and 40 presenters, coming from 13 different countries (Canada, Hungary, India, Iran, Ireland, Qatar, Romania, South Africa, South Korea, Spain, Taiwan, Turkey, and the United States of America). The conference was organized into 10 sessions that included areas such as Exercise Psychology, Athletic Performance, Pediatric Exercise Science, e.t.c. As it is the publication policy of the Institute, the papers presented in this conference will be considered for publication in one of the books of ATINER.

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

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

Gregory T. Papanikos
President

FINAL CONFERENCE PROGRAM

Athens Institute for Education and Research
Human Development Research Division
Research Unit of Sports

**7th Annual International Conference on Kinesiology and
Exercise Science
27-30 June, 2011, Athens, Greece**



**Conference Venue: St George Lycabettus Boutique Hotel, 2 Kleomenous Street,
Kolonaki, Athens**

Organization and Scientific Committee

- Dr. Gregory T. Papanikos, President, ATINER
- Mr. Vagelis Kritikos, President, PASEM.
- Dr. Nicholas Pappas, Vice-President of Academics, ATINER & Professor, Sam Houston State University, USA.
- Dr. Panagiota (Nota) Klentrou, Academic Member, ATINER & Professor, Brock University, Canada.
- Mr. Christos Anagnostopoulos, Head, Sports Research Unit of ATINER & Lecturer, Coventry University, U.K.
- Dr. Chris Sakellariou, Vice-President of Finance, ATINER & Associate Professor, Nanyang Technological University, Singapore.
- Dr. George Karlis, Academic Member, ATINER & Associate Professor, University of Ottawa, Canada.
- Dr. Margarita Kefalaki, Researcher ATINER.
- Ms. Lila Skountridaki, Researcher, ATINER & Ph.D. Student, University of Strathclyde, U.K.
- Ms. Gina M. Bondi, Researcher, ATINER.
- Mr. Apostolos Kotsaspyrou, Researcher, ATINER.

Administration

Fani Balaska, Chantel Blanchette, Stavroula Kiritsi, Eirini Lentzou,
Konstantinos Manolidis, Katerina Maraki & Syla Sakka

CONFERENCE PROGRAM

Monday 27 June 2011

08:00-08:30 Registration

08:30-09:00 Welcome and Opening Remarks

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

09:00-10:30 Session I (Room A): New Trends in Health Education and Fitness Management

Chair: Papanikos, G.T., President, ATINER & Bondi, G.M., Researcher, ATINER.

1. *Desbiens, J.F., Professor, University of Sherbrooke, Canada. Creating an Environment Favourable to Learning: A Challenge for Health and Physical Education Student Teachers.
2. Goebel, R., Assistant Professor, Qatar University, Qatar. Health Factors in Qatar and the Sport Science Program of Qatar University.
3. Vickey, T., Ph.D. Student, National University of Ireland at Galway, Ireland. Can a Tweet Make you Fit?
4. Baltrus, P., Assistant Professor, Morehouse School of Medicine, USA. Trends in Physical Activity in the U.S. before and during the Current Financial Crisis.

10:30-12:30 Session II (Room A): Exercise Biochemistry

Chair: *Desbiens, J.F., Professor, University of Sherbrooke, Canada.

1. Nyakas, C., Professor, Semmelweis University, Budapest, Hungary. Physical Activity and Prevention: Effects of Selective Breeding for High Wheel Running Activity on Nutrition, Metabolism and Behaviour.
2. *Noble, E., Professor, The University of Western Ontario, Canada & Wolff, S.M., The University of Western Ontario, Canada. Exercise Promotes a Temperature Dependent Expression of Heat Shock Proteins in the Vasculature.
3. Lee, S.J., Associate Professor, Korea University, Korea & Hoang, M.H., Korea University, Korea. Taurine, a Nutrient Improving Motor Activity, Stimulates the Reverse Cholesterol Transport in Macrophages and Improves Lipid Metabolism in Vitro.
4. Wei, Y.L., Master Student, National Cheng Kung University, Taiwan & Hung, C.H., Associate Professor, National Cheng Kung University, Taiwan, Effect of Exercise Training on Heat Shock Protein 72 Expression in the Brain of Type I Diabetic Rats. (Monday, 27th of June, 2011, afternoon)
5. Marosi, K., Ph.D. Student, Semmelweis University, Hungary. Physical Activity and Brain Aging.

12:30-14:00 Session III (Room A): Exercise Psychology

Chair: *Noble, E., Professor, The University of Western Ontario, Canada

1. Jackson, D., Assistant Professor, Slippery Rock University, USA, French, R., Professor, Texas Woman's University, USA, Terry A.S., Associate Professor, Texas Woman's University, USA & Nichols, D., Associate Professor, Texas Woman's University, USA. Efficacy of Evidence-Based Physical Activity within a Secure Juvenile Correctional Facility.
2. Aslan, S., Lecturer, Pamukkale University, Turkey, Agbuga, B., Lecturer, Pamukkale University, Turkey & Alptekin, A., Lecturer, Pamukkale University, Turkey. The Comparison between Exercising and Non-Exercising Individuals' Stress Levels.
3. Pomin, F., Researcher, Universidade de A Coruna, Spain, Ezquerro, M., Universidade de A Coruna, Spain & de Ozamiz Leston, I., Researcher, Universidade de A Coruna, Spain. Differences in Perception of Body Image and Associated Psychophysiological Variables between Male and Female Athletes.
4. Ghasemi, A., Assistant Professor, Science and Research Branch, Islamic Azad University, Tehran, Iran. The Effect of a Special Olympics Program on the Self Efficacy of Individuals with Down Syndrome.

14:00-15:00 LUNCH

15:00-16:15 Session IV (Room A): Cardiorespiratory and Hormonal Adaptations

Chair: Vardaxis, V., Professor, Des Moines University, USA.

1. Copeland, J., Associate Professor, University of Lethbridge, Canada & Verzosa, M.L.S., University of Lethbridge, Canada. Changes in IGF-I and Estrogen in Pre- and Post-Menopausal Women after an Ultra-Marathon.
2. Stanescu, C.M., Associate Professor, Colentina University Hospital Bucharest, Romania, Stanescu, D., Clinical Institute Fundeni Bucharest, Romania, Manoliu, V., University Politehnica Bucharest, Romania, Branidou, K., Colentina University Hospital Bucharest, Romania, Dan, G.A., Colentina University Hospital Bucharest, Romania, Chirion, C., Clinical Institute Fundeni Bucharest, Romania, Stan, C., Clinical Institute Fundeni Bucharest, Romania, Dan, A., Colentina University Hospital Bucharest, Romania & Baicus, C., Colentina University Hospital Bucharest, Romania. Exercise Evaluation of Right Ventricle in Obesity - A Supine Exercise Echocardiographic and Radionuclide Study.
3. Behnke, B., Assistant Professor, University of Florida, USA & Adihetty, P., Assistant Professor, University of Florida, USA. Aging and Exercise Training Reduce Testes Microvascular PO₂.
4. Christou, D., Assistant Professor, University of Florida, USA, Moreau, K.L., University of Colorado, USA & Seals, D.R., University of Colorado, USA. Higher Levels of Leisure-time Physical Activity and Aerobic Fitness are related to Greater Vascular Endothelial Function Independent of Age and Sex.

16:30-18:00 Session V (Room A): Evaluation of Exercise Training Methods

Chair: Behnke, B., Assistant Professor, University of Florida, USA

1. Aslan, U.B., Vice Director, Pamukkale University, Turkey. Relationships between Single Leg Half Squat, Single Leg Decline Squat, and Anthropometric Characteristics of Young Adults.
2. *Kali Venkata, R., Assistant Director, University of Hyderabad, India. "Panoptic Differential Training: Biodynamics Approach for Sprint Performance" - A Wholistic Future Training Method.
3. Adhihetty, P., Assistant Professor, University of Florida, USA. The Effect of Resveratrol Treatment and Caloric Restriction on Doxorubicin-Induced Toxicity in Aged Rat Skeletal Muscle.
4. Nolte, K., Lecturer, University of Pretoria, South Africa, Krüger, P.E., University of Pretoria, South Africa & Schalk Els, P., University of Pretoria, South Africa. Three Dimensional Musculoskeletal Modelling of the Seated Biceps Curl Resistance Training Exercise.

18:15-19:30 Session VI (Room A): Population Specific Physical Activity Profiles

Chair: *Kali Venkata, R., Assistant Director, University of Hyderabad, India.

1. Vardaxis, V., Professor, Des Moines University, USA. Pain Effect on Physical Activity Profiles of Hip Osteoarthritis Patients.
2. Kosma, M., Associate Professor, Louisiana State University, USA, Ellis, R., Associate Professor, Georgia State University, USA & Bauer, J., Professional Associate, Hayes +Associates, Inc, USA. Longitudinal Changes in Psychosocial Constructs and Physical Activity among Adults with Physical Disabil
3. Nolan, V., Lecturer, Vaal University of Technology, South Africa & Surujlal, J., Lecturer, Vaal University of Technology, South Africa. Perception of Working Women Regarding their Participation in Physical Activities.

21:00-23:00 Greek Night and Dinner

Tuesday 28 June 2011

09:00-10:00 Session VII (Room A): Athletic Performance

Chair: *Shan, G., Professor, University of Lethbridge, Canada.

1. Lystad, R., Ph.D. Student, Macquarie University, Australia, Graham, P.L., Lecturer, Macquarie University, Australia & Bonello, R., Associate Professor, Macquarie University, Australia. Incidence and Severity of Competition Injuries in Australian Taekwondo Athletes.
2. Gokkaya, M., Master Student, Kocaeli University, Turkey, Akbal, V., Master Student, Kocaeli University, Turkey, Meric Bingül, B., Master Student, Kocaeli University, Turkey, Aydın, M., Master Student, Kocaeli University, Turkey & Bulgan, C., Master Student, Kocaeli University, Turkey. The Effect of Pilates on the Balance and Flexibility of the Figure Skaters. (Tuesday, 28th of June, 2011)

10:00-11:30 Session VIII (Room A): Exercise Training and Motor Ability in Older Adults

Chair: Nyakas, C., Professor, Semmelweis University, Budapest, Hungary.

1. Conn, V., Professor, University of Missouri, USA. Meta-Analysis of Older Adults' Health Outcomes from Supervised Exercise Interventions.
2. Li, G.S.F., Associate Professor, National Chung Cheng University, Taiwan & Wang, A.H.H., National Chung Cheng University, Taiwan. Effect of an Integrated Group Exercise Program on Functional Fitness, Health-related Quality of Life, and Exercise Behavior in Underserved Agricultural Community Older People. (Tuesday, 28th of June, 2011)
3. Christou, E., Associate Professor, University of Florida, USA, Baweja, H.S., University of Florida, USA, Kwon, M.H., University of Florida, USA, Kennedy, D.M., University of Florida, USA, Chen, Y.T. University of Florida, USA & Kim, C., University of Florida, USA. Processing of Visual Information Contributes to the Amplification of Motor Output Variability in Older Adults.
4. *Shan, G., Professor, University of Lethbridge, Canada & Zhang, X., University of Lethbridge, Canada. A Method for Quantifying Sensori-motor Function Related to Age and Evaluating Effectiveness of Various Physical Exercises for Seniors.

11:30-14:00 Session IX (Room A): Pediatric Exercise Science

Chair: Christou, E., Associate Professor, University of Florida, USA

1. *Hinckson, E., Head of Research, Auckland University of Technology, New Zealand. Twenty Four Hour Monitoring of Children's Habitual Activity Using the ActiPAL Accelerometers.
2. Jacobs, S., Lecturer, Tshwane University of Technology, South Africa & De Ridder, H., Professor, North-West University, South Africa. Differences in Body Composition and Prevalence for Postural Deviations in Girls from Two Racial Groups in South Africa.
3. Van den Berg, L., Lecturer, Tswane University of Technology, South Africa. The Effect of Growth and Maturation on the Physical and Motor Abilities, as well as Rugby Skills of Early, Average and Late Developers: A Longitudinal Study.
4. McGrath, L., Ph.D. Student, Auckland University of Technology, New Zealand, Hinckson, E., Professor, Auckland University of Technology, New Zealand, Hopkins, W., Auckland University of Technology, New Zealand. Accelerometer Measurement Issues In A Primary School Play Intervention.
5. Aminian, S., Ph.D. Student, Auckland University of Technology, New Zealand. Examining the Validity of the ActiPAL Monitor in Measuring Sitting and Ambulatory Movement in Children.

14:00-15:00 Lunch

15:00-16:00 Session X (Room A): Physical Education Program Evaluation and Other Issues

Chair: *Hinckson, E., Head of Research, Auckland University of Technology, New Zealand.

1. Agbuga, B., Professor, Pamukkale University, Turkey. The Relationship between Perceived Motivational Climate and Self-Reported Effort/Persistence in Secondary Physical Education.
2. Williams, A., Associate Professor, Indiana University, USA & Pedersen, P.M., Associate Professor, Indiana University, USA. Building Brand Loyalty in the Fitness Industry. (Tuesday, 28th of June, 2011, afternoon)
3. D'Acierno, M.R., Associate Professor, University Parthenope Napoli, Italy. Sport, Music and Foreign Languages. (Tuesday, 28th of June, 2011)

16:30-19:30 Urban Walk

20:00- 21:00 Dinner

Wednesday 29 June 2011

Cruise: Departure at 07:15 Return at 20:30

Thursday 30 June 2011

Delphi Visit: Departure at 07:45 Return at 19:30

Peter J. Adhietty

Professor, University of Florida, USA.

The Effect of Resveratrol Treatment and Caloric Restriction on Doxorubicin-Induced Toxicity in Aged Rat Skeletal Muscle

Aging is associated with a loss in muscle known as sarcopenia which is partially attributed to mitochondrially-mediated apoptosis. In aging rodents, caloric restriction (CR) increases health and longevity by improving mitochondrial function. Resveratrol (RSV) is a polyphenol found in red wine and when administered to rodents produces similar beneficial mitochondrial alterations as CR. Doxorubicin (DOX) is an effective chemotherapeutic agent but has limited clinical use due to its off-target tissue toxicity. DOX-induced muscle toxicity results from increased free radical production contributing to impaired mitochondrial regulatory processes and elevated mitochondrially-mediated apoptosis. Although RSV and CR improve mitochondrial function in skeletal muscle, the detailed cellular and molecular mechanisms remain largely unknown. Objectives: To determine whether RSV (50 mg/kg/day; 6 weeks) and CR (20% reduced AL; 6 weeks) can attenuate DOX-induced toxicity in skeletal muscle. Methods: Aged F344xBN rats (26 mo) were divided into eight groups (n=4): ad libitum (AL), CR, RSV, RSV+CR (6 weeks of treatment); and injected with either DOX (20 mg/kg IP) or saline 24 hours prior to sacrifice. Markers of mitochondrial content/regulation (cytochrome c, cytochrome c oxidase activity, PGC-1 α , SIRT3) and apoptotic susceptibility (Bax:Bcl-2, AIF) were measured in the quadriceps muscle using Western blotting. Results: Acute DOX treatment increased the Bax:Bcl-2 in AL animals while CR, and CR+RSV treatment significantly reduced the Bax:Bcl2 ratio by approximately 50-70% ($p<0.05$) compared to AL. DOX treatment tended to increase pro-apoptotic AIF in AL, CR and RSV treated animals but the combination of CR+RSV suppressed this induction. Surprisingly, mitochondrial regulatory/functional markers were not significantly affected by CR, RSV or CR+RSV treatment when compared to AL animals, and DOX treatment had no effect across all groups. Conclusions: Our data suggests that acute DOX-treatment increases mitochondrially-mediated apoptosis and that CR and/or the combination of CR/RSV pre-treatment can provide some cellular protection.

Bulent Agbuga

Professor, Pamukkale University, Turkey.

Sehmus Aslan

Lecturer, Pamukkale University, Turkey.

Yuksel Kepenek

Pamukkale University, Turkey.

Ugur Dundar

Pamukkale University, Turkey.

The Relationship between Perceived Motivational Climate and Self-Reported Effort/Persistence in Secondary Physical Education

This study examined the relationship between students' perceived task-involved and ego-involved climates and self-reported persistence/effort, as well as how these goals might affect student reports of the persistence and effort they expended toward physical education. Participants consisted of 228 middle and high school students attending two public schools in central Turkey. They were 111 8th graders (57 boys and 54 girls, M age = 14.05, SD = 0.67) and 117 11th graders (64 boys and 53 girls, M age = 17.28, SD = 0.90). The students responded to a two-part questionnaire. The first part consisted of demographic information including age, grade, gender, and school. The second part assessed student perceived motivational climate and self-reported persistence/effort in physical education. Correlation analysis showed that task-involved and ego-involved climates related positively to student persistence/effort. Multiple regression analysis revealed that task-oriented and ego-oriented climates were significant positive predictors of persistence/effort. These results provided additional support to the previous research found that students perceive the classroom as task- or ego-involved, and that perception influences their motivation and achievement behavior. The MANOVA yielded a significant main effect for grade. Follow-up univariate ANOVAs revealed that only 8th graders placed significantly higher values on students' self-reported persistence/effort. These findings suggest that the complex nature of perceived motivational climate in influencing students' persistence/effort may depend on physical education settings, grade levels, and socio-cultural norms.

Saeideh Aminian

Ph.D. Student, Auckland University of Technology, New Zealand.

Erica Hinckson

Head of Research & Primary Supervisor, Auckland University of Technology, New Zealand.

Examining the Validity of the ActivPAL Monitor in Measuring Sitting and Ambulatory Movement in Children

Background: Decreasing sedentary activities that involve prolonged sitting may be an important strategy to reduce and prevent lifestyle-related diseases such as obesity in children. The first step to understanding the effect of sedentary activities on children's health is to objectively assess these activities with a valid measurement tool.

Objective: We sought to examine the validity of the ActivPAL monitor to accurately determine the time children spend sitting, standing, and walking and count steps.

Methods: Twenty five healthy primary school children (age 9.99 ± 0.31 years; BMI 18.24 ± 2.05 (mean \pm SD)) were randomly recruited from 20 schools across the Auckland region, New Zealand. Children were monitored while performing a number of sitting, standing, walking and running tests, walking and running on a treadmill at various speeds (50, 66, 94, 133 $\text{m}\cdot\text{min}^{-1}$) for 2-minute stages and at three self-selected speeds (slow, normal, fast), against video observation. Simultaneously, the accuracy of time spent in all activities and step counts measured by the ActivPAL were compared against two pedometers; the New Lifestyles NL-2000 and the Yamax Digi-Walker SW-200.

Results: Preliminary evidence showed a perfect correlation between the ActivPAL monitor in time spent sitting, standing and walking with direct observation. Unlike the pedometers, the ActivPAL did not misclassify fidgeting as steps taken. Strong correlations ($r=0.95-1.00$) between the ActivPAL step counts and video observation during slow, normal, and fast treadmill walking and during over-ground walking and running at self-selected speeds were also observed. However, for treadmill running, there was a negative correlation between total ActivPAL steps and video observation.

Conclusion: The ActivPAL monitor is a valid measurement tool for assessing time spent sitting, standing, walking and counting steps but does not accurately count steps taken during treadmill running in healthy children. The ActivPAL monitor is a suitable tool for measuring sedentary activities in children.

Sehmus Aslan

Lecturer, Pamukkale University, Turkey.

Bulent Agbuga

Professor, Pamukkale University, Turkey.

Ahmet Alptekin

Lecturer, Pamukkale University, Turkey.

The Comparison between Exercising and Non-Exercising Individuals' Stress Levels

Although previous studies improved that regular exercise has a variety of physiological benefits, there is still need to study more closely what psychological benefits are. The purpose of this study, therefore, was to investigate exercising and non-exercising individuals' stress levels. A total of 151 people (75 women and 76 men: $X_{age} = 36,55 \pm 7.08$) participated in the current study. Eighty people (42 men and 38 women) reported to attend regularly in several exercise programs (e.g., swimming, strength training, step-aerobic, and pilates) in a fitness center. The exercise programs consisted of at least three days a week, one and half hour sessions on nonconsecutive days. On the other hand, 71 non-exercising people (34 men and 37 women) participated in this study. Stress level of participants were determined by using "Stress Source Scale" which was developed by Baltas and Baltas (2000). The questionnaire consists of four subscales including socially stress, stress related work, self perception, and physical environment. Data analysis utilized one-way ANOVA test to examine stress level differences between exercising and non-exercising individuals. Results indicated significant differences between exercising and non-exercising individuals' stress levels [$F(1, 148) = 44,22, p = .000$ for socially stress; $F(1, 148) = 35,13, p = .000$ for stress related work; $F(1, 148) = 21,52, p = .000$ for self perception and $F(1, 148) = 13,59, p = .000$ for physical environment subscales, respectively]. Specifically, exercising individuals had low scores including socially stress, stress related work, self perception, and physical environment subscales compared with non-exercising individuals. The results of this study confirmed that exercising regularly have positive effect to reduce stress level of people. More quantitative and qualitative studies, however, are needed to perform to examine the benefits of exercise by looking through different psychological aspects.

Ummuhan Bas Aslan

Vice Director & Associate Professor, Pamukkale University, Turkey.

Ugur Cavlak

Professor, Pamukkale University, Turkey.

Emre Baskan

Pamukkale University, Turkey.

Emine Aslan Telci

Pamukkale University, Turkey.

Relationships between Single Leg Half Squat, Single Leg Decline Squat, and Anthropometric Characteristics of Young Adults

Objectives: The aim of this study was to determine correlation between anthropometric characteristics and single leg half squat and decline squat test in young adults.

Methods: One hundred and fifty young adults (75 female and 75 male) aged between 17 to 26 years (mean \pm SD=20,94 \pm 1,81) participated in this study. Single leg half squat and decline squat tests were performed by the participants. Subjects stand on single leg and squats whilst trying to maintain an upright posture for half squat test. On the other hand, subjects stands on decline board angled at 25 and squats whilst trying to maintain an upright posture for decline squat test. Anthropometric characteristics of subjects in terms of height, weight, body mass index, weight-hip ratio, length of thigh, length of lower limb, mid-circumference of thigh, thigh skinfold were also measured. Data were collected from the dominant limb of each participant; the dominant limb was defined as the limb with which they would kick a football. Spearman test was used for statistical analysis.

Results: While half squat test was positively correlated with height ($r = 0.36$, $p < 0.05$), length of thigh ($r = 0.25$, $p < 0.05$), and length of lower limb ($r = 0.33$, $p < 0.05$) in female young adults, it was not found relationship between half squat and decline squat tests, and anthropometric characteristics in male young adults.

Conclusions: Our results show that anthropometric characteristics including height and length of thigh are moderately with single leg half squat in female young adults. However, there has no correlation in terms of single leg half squat and decline squat tests in male young adults.

Peter Baltrus

Assistant Professor, Morehouse School of Medicine, USA.

Trends in Physical Activity in the U.S. before and during the Current Financial Crisis

Objectives: Low socioeconomic status is associated with lower levels of leisure time physical activity. A financial crisis began in the U.S. in 2007, but trends in leisure-time physical activity before and during the crisis have not been reported. We will exam trends in physical activity levels before and during the crisis in the general U.S. population and in the population stratified by age groups, gender, socioeconomic and employment status and race/ethnicity. It is hypothesized that there will be an observable decrease in physical activity in the general population and among vulnerable groups in particular. **Methods:** We will use data from the National Health Interview Survey (NHIS) to exam trends in mean physical activity levels pre-crisis (2005, 2006) and after the start of the crisis (2008, 2009), data from 2007, the year the crisis began will also be examined. **Preliminary Results:** Activity levels in the general population were similar for 2005, 2006 and 2007 but significantly and substantially higher in 2008 and 2009. Mean (95% CI) light/moderate activity in minutes per week were 2005: 110.4(106.1,114.7); 2006: 110.2(104.7,115.8); 2007: 107.9(102.8,113.0); 2008: 114.3(108.8,119.7); 2009: 127.2 (121.6,132.8). Mean (95% CI) vigorous activity in minutes per week were 2005: 80.9 (77.6, 84.2); 2006: 85.1(80.4,89.7), 2007: 83.9(79.1,88.6); 2008: 90.9(86.1,95.8), 2009: 99.4 (95.2, 103.7). **Conclusions:** For the general population the hypothesized direction of association was not observed, mean time spent in leisure time physical activity has increased since the start of the financial crisis. We will examine if the same trend is observed in population subgroups.

Brad Behnke

Assistant Professor, University of Florida, USA.

Peter Adhietty

Assistant Professor, University of Florida, USA.

Aging and Exercise Training Reduce Testes Microvascular PO₂

Testicular function, and associated testosterone levels, decline with advancing age and an impaired O₂ supply may contribute, in part, to this reduction. Objectives: We hypothesized that there would be a reduced microvascular PO₂ (PO_{2m}) in the testes from aged rats, and this reduced PO_{2m} would be associated with impaired vasomotor control in isolated resistance arterioles. In addition, given the positive effect of chronic exercise on microvascular PO₂ and arteriolar function, we further hypothesized that there would be an enhanced PO_{2m} in the testes from aged animals after aerobic exercise training. Methods: Testicular PO_{2m} was measured *in vivo* via phosphorescence quenching in young and aged sedentary (SED) and exercise trained (ET; 15 m/min treadmill walking, 15 degree incline, 5 days/week for 10 weeks) male Fisher-344 rats. Results: In the sedentary animals testicular PO_{2m} was reduced by ~ 50% with old age (aged SED 11.8 ± 1.9 vs. young SED 22.1 ± 1.1 mmHg) and vasomotion within the testes was eliminated. Contrary to our hypothesis, exercise training did not alter PO_{2m} in the aged group and reduced testicular PO_{2m} in the young animals, abolishing age-related differences (young ET 10.0 ± 0.8 vs. aged ET 10.7 ± 0.9 mmHg). However, in the aged animals exercise training reestablished vasomotion, albeit with a reduced oscillation frequency compared to younger counterparts. Conclusions: In summary, advancing age is associated with a reduced PO_{2m} and impaired vasomotion. Although exercise training did not enhance PO_{2m} in the aged group, it did elicit observable vasomotion, which is thought to be requisite for testicular function. The diminished testicular microvascular driving pressure of O₂ and associated vascular dysfunction provides mechanistic insight for the old age-related decrease in testicular function and a reduced PO_{2m} may contribute, in part, to reduced fertility parameters after exercise training.

Demetra D. Christou

Assistant Professor, University of Florida, USA.

Kerrie L. Moreau

University of Colorado, USA.

Douglas R. Seals

University of Colorado, USA.

Higher Levels of Leisure-time Physical Activity and Aerobic Fitness are related to Greater Vascular Endothelial Function Independent of Age and Sex

Objective: Aerobic exercise training improves vascular endothelial function (endothelium-dependent dilation) in previously sedentary middle-aged and older healthy men. However, the impact of habitual leisure-time activity (LTA) and aerobic fitness on endothelium-dependent dilation remains unknown in healthy adults. We hypothesized that LTA and aerobic fitness will be positively associated with endothelium-dependent dilation, independent of age and sex. **Methods:** To test this hypothesis we measured LTA (Modifiable Activity Questionnaire), aerobic fitness (maximum aerobic capacity; VO_{2peak}) and endothelium-dependent dilation (flow mediated dilation; % change in brachial artery diameter after reactive hyperemia using ultrasonography) in 483 men and women, free of clinical disease, 18 to 79 years of age. **Results:** LTA ranged from 0 to 371 met-hrs/week and VO_{2peak} ranged from 14.2 to 63.7 ml/kg/min. Using bivariate correlations, greater levels of LTA and VO_{2peak} were related with greater EDD ($r= 0.11$ and 0.22 , $P\leq 0.01$, respectively). Using multiple linear regression, LTA and VO_{2peak} were positively related with endothelium-dependent dilation ($r_{part}=0.08$, $P=0.04$ and $r_{part}=0.10$, $P=0.01$, respectively), independent of age and sex. In both regression models, age was negatively associated with EDD ($r_{part}=-0.24$ and -0.19 , $P<0.0001$), but sex was not significantly related with EDD ($r_{part}=0.05$ and 0.07 , $P>0.05$). Adults in the highest tertile of aerobic fitness had greater endothelium-dependent dilation compared to those in the lowest tertile of aerobic fitness (mean \pm SD; 6.8 ± 2.7 vs. $5.3\pm 2.6\%$, $P=0.01$) after accounting for age and sex. **Conclusion:** Higher levels of leisure-time physical activity and aerobic fitness are related to greater vascular endothelial function, independent of age and sex.

Evangelos Christou

Associate Professor, University of Florida, USA.

H. S. Baweja

University of Florida, USA.

M. H. Kwon

University of Florida, USA.

D. M. Kennedy

University of Florida, USA.

Y. T. Chen

University of Florida, USA.

C. Kim

University of Florida, USA.

Processing of Visual Information Contributes to the Amplification of Motor Output Variability in Older Adults

Objectives: Numerous changes to the aging visual system can potentially alter the ability older adults to perform motor adjustments and consequently amplify motor output variability. The purpose of these studies was to determine whether amplified visual feedback of the task impairs the ability of older adults to control their movement output. Methods: We performed two experiments to address our purpose. In experiment 1, subjects accurately matched a sinusoidal target (0.1 Hz and 10° range of motion) by abducting and adducting their index finger. Subjects performed 48 trials, which included 8 blocks of 6 trials. For each block subjects received visual feedback of their movement relative to the target for the first 5 trials (visual-feedback trials at 5.4°) and no visual feedback of their movement for the 6th trial (no-vision trial). Following the 48 trials, subjects watched a movie (interference task) for 60 minutes, followed by ten retention trials (five under each visual feedback condition). Neural activity of the involved antagonistic muscles was measured using intramuscular electromyography. In Experiment 2, we manipulated the amount of visual feedback and the effector (limb) used. We asked subjects to match the same sinusoidal target with abduction of their index finger and dorsiflexion of their ankle at three distinct visual angles (0.25°, 1° and 5.4°). Neural activity of the involved muscles was measured using surface electromyography. Results: Experiment 1: As expected, the movement error and variability were greater for older adults during the visual feedback trials. In contrast, during the no-vision trials age-associated differences in movement error and variability were abolished. Older adults exhibited greater antagonistic coactivation from 5-60 Hz. Another interesting finding of Experiment 1 was that short-

term adaptations in learning the sinusoidal task were similar for young and older adults. Experiment 2: The findings of this experiment supported and extended those of Experiment 1. Specifically, lower amount of visual feedback (lesser visual gain) minimized the age-associated differences in movement variability for both the index finger and ankle movements. Similar to Experiment 1, the oscillatory activation of the primary agonist muscles was different for young and older adults from 5-100 Hz. Conclusions: We demonstrate that age-associated differences in movement control are minimized with lesser amount of visual feedback. It is possible; therefore, that older adults do not process visual information as well as young adults and that impairs their motor output.

Vicki Conn

Professor, University of Missouri, USA.

Meta-Analysis of Older Adults' Health Outcomes from Supervised Exercise Interventions

Objective: This comprehensive meta-analysis was designed to synthesize the fitness, lipids, diabetes risk, and anthropometric outcomes of supervised exercise among healthy older adults.

Methods: Extensive search strategies were used to locate published and unpublished studies of supervised exercise with verified exercise dose. Only studies which compared treatment and control subjects were included. All data were duplicate extracted by independent coders to achieve full reliability. Random-effects models were used to estimate standardized mean differences (*d*-indices). Effect sizes were weighted by inverse of variance to give more influence to larger studies. Heterogeneity was assessed with *Q* and *I*² statistics.

Results: Sample mean ages ranged from 60 to 83 years. Thirty studies were comprised entirely of women while six studies included only men, many studies included both genders. The most common exercise dose was 12 weeks of thrice weekly 45 minute sessions. Effect sizes were calculated from 48 fitness, 45 anthropometric, 15 lipid, and 6 diabetes risk comparisons in primary studies disseminated between 1972 and 2009. The fitness effect size was 0.779 ($p < .001$). For diabetes risk, the effect size was 0.478 ($p = .001$). The effect size for anthropometric outcomes was 0.112 ($p = .055$). The lipid effect size was 0.189 ($p = .148$). Significant heterogeneity (*Q*) was documented for lipid, anthropometric, and fitness outcomes.

Conclusions: This quantitative synthesis documented significant fitness, diabetes risk, and anthropometric outcomes from verified exercise among healthy older adults. The smaller effect size for lipids was not significantly different from zero, but statistical power was limited. Significant heterogeneity suggests variations in sample, intervention, and research procedures may be important. Future moderator analyses should examine characteristics of samples and exercise interventions which may account for differences in outcomes.

Jennifer Copeland

Associate Professor, University of Lethbridge, Canada.

M.L. Sophie Verzosa

University of Lethbridge, Canada.

Changes in IGF-I and Estrogen in Pre- and Post-Menopausal Women after an Ultra-Marathon

Objective: Ultra-endurance competitions are becoming more popular among recreational athletes of all ages. Despite increasing numbers of women participating, no studies have documented the effect of age or menopause on the hormone response to ultra-endurance exercise in women. The purpose of this study was to examine changes in estrogen and the insulin-like growth factor I (IGF-I) system in women competing in either a 50km or 100km ultra-marathon. **Methods:** Participants were 6 post-menopausal women (age: 57.1 ± 3.8 yrs, BMI: 23.8 ± 2.3 , VO_{2max} : 51.0 ± 2.6 ml \cdot kg⁻¹ min⁻¹) and 6 pre-menopausal women (age: 37 ± 5.4 yrs, BMI: 23.6 ± 3.1 , VO_{2max} : 55.1 ± 4.9 ml \cdot kg⁻¹ min⁻¹). Pairs of older and younger women were matched for race finish times with 4 pairs completing the 100km event and 2 pairs completing the 50km event. There was no significant difference in race finish times between the younger and older women (19.2 ± 7.7 hrs versus 20.8 ± 8.4 hrs, respectively). Blood samples were drawn 24 hours before the race, at the finish line, and after 24 hours of recovery. Samples were analysed for estradiol, total IGF-I, and bioactive IGF Binding Protein-3 (IGFBP-3). **Results:** Total IGF-I was significantly lower than baseline immediately following the race ($P < 0.01$), but not after 24 hours of recovery ($P = 0.08$). Bioactive IGFBP-3 decreased post-race and remained lowered in recovery ($P < 0.01$). There were no significant group differences or group by time interactions for either IGF-I or IGFBP-3. In both pre- and post-menopausal women there was a significant increase in estradiol following the race which persisted after 24 hours of recovery ($P < 0.05$). **Conclusion:** These results demonstrate that among recreational female runners, an ultra-marathon is associated with changes in the IGF system that are consistent with an energy-deficient, catabolic state. The increased estrogen was unexpected and the implications are unclear, particularly in postmenopausal women. Estrogen may have a lipolytic, glycogen-sparing effect that could be beneficial during prolonged exercise.

Maria Rosaria D'Acierno

Associate Professor, University Parthenope Napoli, Italy.

Sport, Music and Foreign Languages

This research wants to **demonstrate** that interdisciplinary among **sport, music** and the learning of **foreign languages**, does not only improve our life, but can be practiced at any age.

The **method** used is an extemporary observation of children (two up to seven) as well as of elderly people (fifty and sixty) while practicing physical exercises and while learning foreign languages.

The **results** achieved an adequate average for both groups, and showed a strong motivation in order to carry on the experiment: mental and physical coordination of movements through music as well as interaction with foreigners.

Physical exercises (Weinert and Bielawski 2000, Cogan and Vidmar 2000, James 1989) contribute not only to develop the body (children) and to reassert it (elderly people), but most of all to stimulate cognition. In fact, it is important for children to develop a determined, but also flexible personality, and for adults to regain confidence.

On the other side, the **learning of foreign languages** links the melody of music to the melody of any speech. This is the most difficult task to carry on, since it requires not only time, but also hours of studying by oneself. As a consequence, it is the activity which dropped more subjects. In order to raise motivation, it is extremely important to plan interaction with native speakers, either by organizing parties or by planning journeys. Elderly people need a long-term project, they need to plan their future. Travelling and showing the knowledge of the foreign language implied are two extremely important tasks.

Recent findings indicate that specialized functions of specific regions of the brain are not fixed at birth, but are shaped during the whole life by our experience and learning (Genesee 2000, Banich 1997, Karni et al. 1995).

My **conclusion** is that **music** (O'Shea 1990, Thrasybulos 1989, Wang 2010) serves to develop the brain while guiding the body and the mind; it controls the human voice by giving a perfect melody when speaking.

Jean-Francois Desbiens

Professor, University of Sherbrooke, Canada.

Carlo Spallanzani

Professor, University of Sherbrooke, Canada.

Martin Roy

Professor, University of Sherbrooke, Canada.

Sylvain Turcotte

Professor, University of Sherbrooke, Canada.

Severine Lanoue

Kinesiologist, University of Sherbrooke, Canada.

Jean-Sebastien Tourigny

Health and Physical Educator, University of Sherbrooke, Canada.

**Creating an Environment Favourable to Learning:
A Challenge for Health and Physical Education
Student Teachers**

This lecture aims to describe Health and Physical Education (HPE) learning climate, and to examine student teachers' perceptions on their interaction behaviours. Twenty-five student teachers at the completion of their fourth year of professional training and 565 high school students (years 7 (approx. 12 years old) to 12 (approx. 17 years old) in Quebec) voluntarily participated to this descriptive correlational study design. Data collection was completed with three observation systems (Academic learning time in Physical Education (Siedentop, 2000), Learning Climate Observation System (Martel et al., 1991), and Disciplinary Incident Observation System (Brunelle et al., 1993)) and one high-inference questionnaire on teachers' behaviours perception (Questionnaire for Teacher Interaction (Wubbels et al., 1993)). Descriptive and nonparametric statistical techniques were used to analyze data (frequency count, mean, Spearman rho, multiple correspondence analysis). Results show that student teachers give many encouragements and are perceived as cooperative and supportive. However, favourable motor engagement is low (Mean < 15%) while waiting time (Mean > 30%) and disruption levels are high. Disruptive behaviours' frequency closely corresponds to episodes of tasks that aren't adapted to students' capabilities and to the student teacher "Ignore" behaviour. Meanwhile, favourable motor engagement relates to high frequencies of episodes of appropriate verbal expression (enthusiasm, intonation, volume) and organisation, specific neutral feedbacks, and specific positive feedbacks. Even if students favourably perceive student teachers' interaction behaviour, the learning climate that prevails in student teachers' HPE classes is not likely to allow the attainment of high-order learning objectives. In addition, student

teachers seem to experience a dilemma: how to act supportively without falling into permissive pedagogy? These results raise a number of questions in regards to HPE professional training efficacy.

Abdollah Ghasemi

Assistant Professor, Science and Research Branch, Islamic Azad University, Tehran, Iran.

M. Momeni

Social and Welfare Science University, Tehran, Iran.

M. Falahati

University of Applied Science and Technology, Tehran, Iran.

A. Elahi

Tarbiat Moallem University, Tehran, Iran.

Leila Ghodrati

Tehran Branch, Islamic Azad University, Tehran, Iran.

The Effect of a Special Olympics Program on the Self Efficacy of Individuals with Down Syndrome

The aim of this study was to compare the self- efficacy among Iran Special Olympics members and non-athletes Down syndrome males. 25 male Down Syndrome (age= 24.5 ± 5.2 yrs.) that were the members of Iran national Team (Track and Field, Swimming, Badminton and Soccer) were compared with 25 non- athletes Down Syndrome males (23.9 ± 6.3) in self-efficacy. Athletes group participated in 6 months sport specific program along with 6 sport camping and finally Asia-Africa region Olympic. Wheeler and Ladd (1982) self-efficacy Questionnaire was used to collect data from 2 groups.

The result shown that athletes group are significantly ($P \leq 0.01$) better than non-athletes in all sub-scale of self -efficacy such as general self -efficacy ($p = 0/004$), and social self-efficacy ($p = 0/001$).

It seems that participation in social- sport aspect of Special Olympic programs (medals, social acceptance, peer respect etc.) can promote the self-efficacy among this population. Generalizing these programs for this people can help them to show their abilities and give them self-concept to live without problem.

Ruben Tobias Goebel

Assistant Professor, Qatar University, Qatar.

Health Factors in Qatar and the Sport Science Program of Qatar University

Objectives:

“Sports as inspiration for an active and healthy society” (Q.G.S.D.P. 2011, p. 196) is one of Qatar’s major goals for the future. Qatar is aware of its health problems, specifically obesity, diabetes, and resulting diseases. These facts are apparently in contrast to the number of sport activities and the interest of Qataris in sport. Environmental circumstances impede sportive activity on the one hand, but educational and social background on the other lead to a situation that looks to the future.

Health facts:

In Qatar 9,4% of 15-18 years old are obese (Bener et al., 2011). Among adults overweight and obesity rate lie at 70-88% for 30-60 years old (Ng et al., 2011) and extrapolation of diabetes shows 17% with an increased tendency (Baner et al., 2009). The GCC countries have the highest prevalence of diabetes mellitus (IDF, 2009).

At the same time, Qatar will host more than 45 international Sports events in 2011 organized by 26 sport federations. About 9000 athletes are counted in Qatar.

Sport Science Program, Qatar University (QU):

The New Sport Science Program at QU provides an academic degree (B.Sc) and educates its graduates for professions in the fields of health, education, and management. This unique program in the GCC countries has been established to raise awareness and knowledge of healthy living in the society. Outstanding opportunities for graduates of this 120 CH undergraduate program are already offered by its strong partners.

Conclusion:

Adolescents and adults living in Qatar are at high risk for obesity and diabetes. To improve this situation, Qatar took the first steps to develop an overlapping system for health care and a sportive lifestyle. This system will sensitize the population and match the needs of future generations and educate them. The Sport Science Program plays a major role in this plan.

References:

Bener A. et al. Obesity and low vision as a result of excessive Internet use and television viewing. *International Journal of Food Sciences & Nutrition*, Feb. 2011, Vol. 62, Issue 1, pp. 60-3.

Bener A et al. Prevalence of diagnosed and undiagnosed diabetes mellitus and its risk factors in a population-based study of Qatar. *Diabetes Res Clin Pract*, 2009, Vol 84, pp. 99-106.

International Diabetes Federation. *IDF Diabetes Atlas. Regional Overview. Middle East and North Africa, 2009* (www.diabetesatlas.org/content/middle-east-and-north-africa) [cited 14 Dec 2009]

Ng, S et al. The prevalence and trends of overweight, obesity and nutrition-related non-communicable diseases in the Arabian Gulf States. *Obes Rev*. 2011 Jan;12(1), pp. 1-13.

Mine Gokkaya

Master Student, Kocaeli University, Turkey.

V. Akbal

Kocaeli University, Turkey.

B. Meric Bingul

Kocaeli University, Turkey.

M. Aydin

Kocaeli University, Turkey.

C. Bulgan

Halic University, Turkey.

The Effect of Pilates on the Balance and Flexibility of the Figure Skaters

Aim: The purpose of this study was to determine the effects of pilates exercises on the improvement of balance and flexibility, which are among the most important parameters of figure skating.

Method: 12 figure skaters (age: $7,83 \pm 8,0$) participated to the study as a volunteer who have been members in sport club. As a control group, 6 of them were applied routine figure skating trainings without any pilates exercises, and as a experimental group, the rest 6 of them were applied routine figure skating trainings with pilates exercises.

Figure skaters were trained within the 8 weeks, 2 times each week. The balance parameters of the subjects were measured with flamingo test and the flexibility values of the subjects were measured with sit and reach test before and after the exercises. All data was analyzed by using SPSS 18.0 program by Wilcoxon test.

Result/Conclusion: As a result it was found statistically significant differences for experimental group values of each sit and reach test and flamingo balance test ($p < 0,05$). According to the results pilates exercises have positive effects on flexibility and balance abilities for figure skaters.

Erica Hinckson

PhD & Head of Research, Auckland University of Technology, New Zealand.

Will Hopkins

Professor, Auckland University of Technology, New Zealand.

Saeideh Aminian & Kara Faithfull

Auckland University of Technology, New Zealand.

Twenty Four Hour Monitoring of Children's Habitual Activity Using the ActivPAL Accelerometers

Objective: To quantify and determine day-to-day variability in measures of habitual activity in children wearing an activPAL monitor.

Methods: Sixty-four children (age 10.2 ± 0.9 y, mean \pm SD) were randomly recruited according to socioeconomic background, geographical area and school roll from 30 city schools. Time spent sitting, standing and stepping were measured 24 hours per day for on seven consecutive days. Measurements were repeated a week later. The monitor was waterproofed with a silicon pouch to permit continuous wearing. Mixed modeling in SAS estimated means and SD for the percent of time spent sitting, standing and stepping during different periods of school and weekend days. Reliability was expressed as within subject errors and as intra-class correlation coefficients (ICC).

Results: Excluding evening and sleep periods (20:00-06:00), ranges in percent mean time spent sitting, standing and stepping were respectively 55-72, 18-27 and 10-19 on weekdays and 56-84, 11-29, and 5-20 on weekends (SD \sim 13, \sim 9, and \sim 6); ranges in sit-to-stand transitions per hour on weekdays and weekends were respectively 4.5-7.3 and 3.3-6.8 (SD \sim 2.0). Within-subject variability in time spent sitting, standing and stepping for girls and boys were 4.3 and 2.6, 3.4 and 1.5, 1.3 and 1.4 percent respectively for week days and 3.1 and 4.3, 2.3 and 3.3, 1.9 and 1.9 for weekend days. Overall, children's day-to-day and week-to-week activity and inactivity levels were consistent regardless on period and type of day, resulting in moderate to high intraclass correlation coefficients (\sim 0.31 to 0.64).

Conclusion: Children spend over half of their time during the day sitting. Modest to large sample sizes will be needed to quantify small changes in physical and sedentary activity interventions.

Dallas Jackson

Assistant Professor, Slippery Rock University, USA.

Ron French

Professor, Texas Woman's University, USA.

Terry Senne

Associate Professor, Texas Woman's University, USA.

David Nichols

Associate Professor, Texas Woman's University, USA.

Efficacy of Evidence-Based Physical Activity within a Secure Juvenile Correctional Facility

Objectives:

Purpose was to determine the influence of evidence-based physical activity instruction on postadjudicated (i.e., incarcerated) youths' personal and social responsibility perception, physical fitness levels, and juvenile correctional officers' attitudes toward its implementation within a secure juvenile correctional facility.

Method:

The *Social-Ecological Model* (SEM) was used to frame this study which was based on the concept that a person's development is affected by their interaction with and perception of the environment.

An embedded mixed-method design involved the use of a pretest-posttest control group design to examine the influence of evidence-based physical activity instruction on personal and social responsibility perception, and health-related fitness levels of postadjudicated youth. A descriptive case study approach was also used to investigate juvenile correctional officers' attitudes. Data sources were a personal and social responsibility perception questionnaire, specific items from the *FITNESSGRAM* physical fitness test, a self-report questionnaire, and semi-structured face-to-face interviews using an open-ended interview guide.

Results:

Evidence-based physical activity instruction had no effect on youths' personal and social responsibility perception. However, it did not negatively affect health-related physical fitness levels. Moreover, evidence-based physical activity can influence juvenile correctional officers' attitudes toward physical activity provision. Qualitative analysis showed that juvenile correctional officers believed evidence-based physical activity is more conducive to the rehabilitation program because of the positive changes in the youths' social behaviors that generalized outside of the physical activity environment. They were in favor of changing the traditional program to an evidence-based

physical activity program. They believed physical activity program change would require an outside professional. This influence was triangulated by youths' self-report data which revealed a positive influence on the intervention groups' personal and social responsibility perception across sessions.

Conclusions:

Evidence-based physical activity can influence juvenile correctional officers' attitudes toward the importance of physical activity for rehabilitation of youth who are incarcerated.

Suzanne Jacobs

Lecturer, Tshwane University of Technology, South Africa.

J. Hans De Ridder

Professor, North-West University, South Africa.

Differences in Body Composition and Prevalence for Postural Deviations in Girls from Two Racial Groups in South Africa

Objective: The aim of this study was to compare the prevalence rate for postural deviations and body composition status among two racial groups in South Africa.

Methods: The sample (n = 216) consisted of 89 African girls and 127 Caucasian girls in the age group 11 to 13 years. Anthropometric (BMI and percentage body fat) and body posture measurements were performed. A posture grid and the New York Posture test were used for all postural assessments.

Results: Independent t-tests and effect sizes demonstrated that in the 11 and 13 year old group the Caucasian group had a significantly higher ($p < 0.05$) BMI and percentage body fat than the African group. There were no statistical and practical significant differences in prevalence rate between age groups. The African group had higher prevalence rates in most of the deviations, with winged scapulae, kyphosis, protruding abdomen and lordosis demonstrating a statistical significance ($p < 0.05$) and practical significance (large effect) with regard to the Caucasian group. The higher prevalence rate for uneven shoulders in the Caucasian group was statistically significant ($p < 0.05$) and also visible (medium effect) with regard to the African group. The higher prevalence rate for pronated feet in the African group was statistically significant ($p < 0.05$), and also visible (medium effect) with regard to the Caucasian group.

Conclusions: The prevalence rate was high in both groups and the lack of awareness and the results of this study should support the development of more responsible educational and screening programmes in both rural and urban school environments. The identification of postural deviations is important for prevention, to encourage a healthier posture for children and to prevent resulting painful syndromes.

Rajasekhar Kali Venkata

Assistant Director, University of Hyderabad, India.

“Panoptic Differential Training: Biodynamics Approach for Sprint Performance” - A Wholistic Future Training Method

Background: Both anaerobic and aerobic metabolic systems for ATP synthesis are activated at the initiation of exercise, but dominating system depends on the intensity. Phosphocreatine (PCr) hydrolysis and Anaerobic Glycolysis leading to formation of lactate make major contribution in ATP synthesis, while oxidative phosphorylation at mitochondria contributing minor role in ATP synthesis during the first five seconds of sustained sprinting and for sustained sprinting lasting more than 15 seconds the dynamics of ATP synthesis change markedly. The PCr system contribution progressively decreases while the oxidative phosphorylation contribution progressively increases along with anaerobic glycolysis and becomes highly dominant system of ATP synthesis especially after 12 to 15 seconds. **Biodynamic Implications:** Resting ATP and PCr stores of muscle seems very less responsive to training and hence strengthening lactate transfer and oxidation appear better alternative along with more concentration on early oxidative phosphorylation. Monocarboxylate Transporter (MCT) isoforms like MCT1 and MCT4 expression should be increased to increase the lactate transport, along with increase in the expression of Lactate Dehydrogenase (LDH) and Pyruvate Dehydrogenase (PDH). **Training Implications:** Endurance training like submaximal sprint repetitions increases MCT1 and MCT4 expression leading to lactate uptake and oxidation. With the increase in sustained sprints without much lactate accumulation during the initial seconds improves oxidative enzymal expression significantly. **Recommendation:** Repetition running of high intensity even during the competitive period is not ideal. Instead differential training like repetitions of submaximal runs with initial five to six seconds of high intensity sprinting with four to five minutes recovery may be followed by maximum sprint running of six to eight seconds with three to four minute recovery and finally two or three maximum sprints of the specified duration.

Maria Kosma

Associate Professor, Louisiana State University, USA.

Rebecca Ellis

Associate Professor, Georgia State University, USA.

Jeremy J. Bauer

Professional Associate, Hayes & Associates Inc., USA.

Longitudinal Changes in Psychosocial Constructs and Physical Activity among Adults with Physical Disabilities

Objectives: Given the importance of physical activity (PA) and the low activity levels among adults with physical disabilities, the purpose of this longitudinal study was to use advanced statistical techniques to examine if changes in the transtheoretical model (TTM) constructs (i.e., processes of change, self-efficacy, decisional balance, and the stages of change) affected changes in PA levels over time. **Methods:** 132 adults with physical disabilities, such as multiple sclerosis (53.8%) and spinal cord injuries (30.3%), completed a web-based survey once every four months, for a total of three time points, to assess the TTM constructs and PA. Four latent growth curve analyses were conducted using Mplus₅ to examine if longitudinal changes in the TTM constructs affected temporal changes in PA levels. **Results:** All four hypothesized models fit the sample data well (e.g., $\chi^2 = n/s$ and RMSEA = .06 to < .001). The most important predictor of the initial/intercept (.56) and temporal/slope (.70) levels of PA was the processes of change. The initial levels of the processes of change also predicted changes in PA levels (-.82). None of the other three TTM constructs had a statistically significant effect on PA slopes, although the slope of the stages of change approached a medium effect on PA changes (.33). While the initial levels of self-efficacy did predict the intercept of PA (.46), changes in self-efficacy had no effect on changes in PA levels. **Conclusions:** Health promoters need to focus on the processes of change, such as social support, goal setting, and role modeling, for the initiation and maintenance of PA. Interventionists can also emphasize one's initial exercise levels and positive intentions (stages of change) as well as their positive, beginning exercise experiences (self-efficacy) to motivate people with physical disabilities to initiate an exercise regimen.

Sung-Joon Lee

Associate Professor, Korea University, South Korea.

Minh-Hien Hoang

Korea University, South Korea.

Taurine, a Nutrient Improving Motor Activity, Stimulates the Reverse Cholesterol Transport in Macrophages and Improves Lipid Metabolism in Vitro

Taurine has been shown to improve motor activity and also shows hypocholesterolemic and anti-atherogenic activities in both animals and humans. We investigated a molecular target for taurine in vitro with activation of the liver X receptors (LXRs), the critical transcription factors in the regulation of reverse cholesterol transport in macrophages. We found that taurine directly interacts and activates the transcriptional activity of LXR- α but not LXR- β in the luciferase assay, the TR-FRET, and the limited protease digestion experiment. Taurine stimulation in the THP-1-derived macrophage cells increased cellular cholesterol efflux with induction of LXR- α responsive genes. The cellular cholesterol levels were significantly reduced dose-dependent manners and both the mRNA and protein levels of ABCA1, ABCG1, and ApoE were significantly induced. Interestingly, taurine did not induce lipid synthesis in hepatocytes, although the LXR- α , a transcription factor for lipid synthesis was activated. Cellular cholesterol and triglyceride levels were significantly reduced with taurine treatment in hepatocytes. Taurine stimulation induced the gene expression of SREBP1-c, however, the delayed nuclear translocation of SREBP-1 protein did not affect the expression of the genes in fatty acids synthesis including FAS, SCD-1, L-CAD. These indicate that taurine associated with the ligand binding domain of LXR- α transcription factor and activates key genes in the reverse cholesterol transport without inducing hepatic lipogenesis, thus taurine, which is useful for enhancing motor activity, could be also applied to improve cellular lipid metabolism, particularly for increasing HDL cholesterol levels.

Gladys Shuk-Fong Li

Associate Professor, National Chung Cheng University, Taiwan.

Amy Hsiu-Hua Wang

National Chung Cheng University, Taiwan.

Effect of an Integrated Group Exercise Program on Functional Fitness, Health-related Quality of Life, and Exercise Behavior in Underserved Agricultural Community Older People

Introduction: The health benefits of regular physical activity for elderly are well documented. Little is known about whether an integrated physical activity intervention would have health-related physical fitness and health-related quality of life benefits in Underserved Agricultural Community Older People. **Purposes:** To examine changes in self-reported exercise behaviors, functional fitness, and health-related quality of life as a result of a 16-week integrated functional fitness program in Underserved Agricultural Community Older People. **Methods:** The 16-week progressive intervention consisted of aerobic dance movements, major muscle group training, and well-rounded stretching exercise program. Data were collected before and after the intervention. 407 elderly residents (64.19 ± 10.88) were assessed using functional fitness measures and self-response questionnaires including SF-36 and a self-report containing sections on demographic characteristics, and physical activity categories. Repeated measured t-test was utilized for the data analysis to explore the effects on health-related quality-of-life, and functional fitness after participating in 16-week progressive physical fitness program. **Results:** Older adults experiencing integrated functional exercise training was significantly higher than the control group in some measures of health-related quality of life, functional fitness level, and increased regular exercise behavior. **Conclusions:** These results suggest that strategies to promote increased participation in physical activity among older adults may need to consider intervening in the physical and emotional aspects in highly deprived neighborhoods.

Reidar Lystad

PhD Student, Macquarie University, Australia.

Petra I. Graham

Lecturer, Macquarie University, Australia.

Rod Bonello

Associate Professor, Macquarie University, Australia.

Incidence and Severity of Competition Injuries in Australian Taekwondo Athletes

Objectives:

The purpose of this study was to determine incidence and severity, and identify risk factors for injuries in competition taekwondo.

Methods:

Data were collected prospectively at New South Wales (Australia) State Championships using purpose-made injury reporting forms. Injuries were diagnosed by tournament medical personnel and recorded according to Orchard Sports Injury Classification System (Version 10). Injury severity was based on time lost from competition or training, and determined by conducting post-tournament follow-up interviews of injured athletes. Injury rates and rate ratios (RR) with 95% confidence intervals (CI) were calculated using standard methods, and Poisson mixed-effects models were used to examine the relationship between the potential risk factors and injury rates.

Results:

Preliminary findings from two tournaments revealed an overall incidence of 59.9 (CI: 46.2, 76.4) per 1,000 athlete exposures (A-E), and 15.61 (CI: 11.86, 20.19) per 1,000 athlete-minutes of exposure. Neither age, gender, nor belt rank were found to be significant indicators for injury. The lower limb was found to be the most common injury location (35.0 [CI: 24.8, 48.1] per 1,000 A-E), and contusion was found to be the most common injury type (37.8 [CI: 27.1, 51.3] per 1,000 A-E). The RR of upper limb injuries resulting in fractures versus lower limb injuries resulting in fractures was 23.8 (CI: 3.7, 153.3). The combined incidence of mild injuries (< 1 week) was 19.4 (CI: 12.0, 29.6) per 1,000 A-E; whereas the incidence of moderate and severe injuries (> 1 week) was 16.6 (CI: 9.8, 26.2) per 1,000 A-E.

Conclusion:

Relative to the lower limb a disproportionate number of upper limb injuries were found to result in fracture. This was the first study to report actual time lost from participation in taekwondo. Contrary to previous reports, the current data indicated that 46.2 % of injuries resulted in > 1 week of restricted participation.

Krisztina Marosi

PhD Student, Semmelweis University, Hungary.

Physical Activity and Brain Aging

AIM OF STUDIES

Aging of the brain is accompanied by variable degree of cognitive decline. It is known that estrogens have profound effects on brain aging by exerting neuroprotective types of action. Furthermore, exercise can also play a role in non-pharmacological prevention of psychoneuronal decline. In the present study we aimed at comparing the effects of long-term physical activity and 17 β -estradiol in late adult and aged rats on cognitive functions and the relevant intracellular molecular signaling in the hippocampus. It was assumed that both treadmill exercise and estradiol treatment activate similar neuroprotective pathways and support mitochondrial function.

METHODS

The following cognitive behavioral tests were applied: novel object recognition, Y-maze, and Morris Water Maze learning tests. The biochemical markers were assayed by Western blot: BDNF, p-MAPK, p-CREB, synapsin, synaptophysin. The amount of reactive oxygen species (ROS) and carbonylated proteins were also measured.

RESULTS AND SUMMARY

Results showed that both treatments improved learning and memory functions of late adult rats. Like 17 β -estradiol, physical activity enhanced the level of BDNF resulting in the activation of MAPK/CREB pathway. The treatments also enhanced the level of synaptic molecules, which could underlay the improved cognitive functions. In addition, the level of ROS and the amount of carbonylated proteins decreased significantly in the hippocampus in response to the treatments. Similar tendencies were observed in aged animals, but the changes were training intensity-dependent. In summary, both exercise and estradiol can produce rather comparable neuro- and psychotropic effects also in aging brain, which indicates that similar cellular signaling mechanisms should be operated.

Les McGrath

Ph.D. Student, Auckland University of Technology, New Zealand.

Erica Hinckson

Professor, Auckland University of Technology, New Zealand.

Will Hopkins

Auckland University of Technology, New Zealand.

Accelerometer Measurement Issues in a Primary School Play Intervention

Objectives: Play during recess is an important opportunity for children to accrue moderate and vigorous activity. Actical accelerometers were used to determine if children accumulate additional activity during an extra play period before school. Children in accelerometer-based studies often provide incomplete data that leads to their results being excluded from analysis. We investigate the issues that hinder determination of an intervention effect including compliance, monitor failure and other events that reduce analysable data in a crossover intervention study of children's physical activity. **Methods:** Actical accelerometer data were collected in 79 children (age 9.7 ± 0.4 y, mean \pm SD) for 7 to 28 d pre and post a crossover play intervention over 6 months at two schools. The intervention provided children with an optional supervised play period before school (8-9am) and free access to play equipment for use during playtimes. **Results:** Girls in the intervention groups had reductions in BMI (intervention; 17.74 to 17.57 kg/m² vs control; 17.54 to 17.60 kg/m²) and overall BMI of boys receiving the intervention remained constant. The mean days girls and boys wore accelerometers were 19 ± 6 and 17 ± 7 respectively. Each day ~20% of children did not wear accelerometers. The percentage of data available for analysis was further reduced owing to faulty monitors, withdrawals, absenteeism, lost accelerometers, and children changing school. Incomplete accelerometer data resulted in 50% of children's results being excluded from analysis. The children that provided analysable accelerometer data participated in slightly less moderate and vigorous activity in the post intervention measurement weeks. **Conclusions:** To reduce potential bias of intervention results and increase the likelihood of detecting small intervention effects sample sizes could be increased. Or alternatively, to reduce omission of data, it is recommended that researchers test monitors rigorously before field placement and fit accelerometers permanently on participants.

Earl Noble

Professor, The University of Western Ontario, Canada.

Steven M. Wolff

The University of Western Ontario, Canada.

Exercise Promotes a Temperature Dependent Expression of Heat Shock Proteins in the Vasculature

Objectives: The vasculature is an important target for chronic age-related diseases such as atherosclerosis and type II diabetes. Heat shock (HS) and exercise (EX) have been observed to increase the inducible isoform of the 70 kDa heat shock protein (Hsp70) in the vasculature and this is associated with vascular protection. The EX response is less robust than HS, however. As previous investigations have suggested that there may be a threshold for the exercise induced activation of the HS response, the purpose of the present investigation was to determine if the vascular content of Hsp70 is associated with the core temperature attained during exercise.

Methods: Adult male Sprague Dawley rats were randomized into control (CON) and EX (60 min treadmill running, 30 m/min for 5 days) or HS (42°C, 15 min) groups. Left ventricles (LV) were harvested at 24 hrs post-treatment and analyzed for Hsp70 by both western blotting and confocal immunofluorescence microscopy.

Results: Both HS and EX resulted in significant increases in Hsp70 in LV homogenates. Confocal microscopy revealed that most of the increase was associated with the vasculature. Although Hsp70 was evident 24 hr post-exercise in all animals, vascular content was elevated as the core temperature increased. Moreover, Hsp70, which tended to co-localize primarily with smooth muscle at the lower post-exercise, core temperatures was observed in the endothelium as well at higher temperatures.

Conclusions: These findings indicate that the vascular content of Hsp70 is increased as the exercise-induced, core temperature is elevated. Given that greater exercise intensities and core temperatures are often linked, they further suggest that exercise intensity may be an important variable in the vascular protection associated with exercise.

Verena Nolan

Lecturer, Vaal University of Technology, South Africa.

Jhalukpreya Surujlal

Lecturer, Vaal University of Technology, South Africa.

Perception of Working Women Regarding their Participation in Physical Activities

Objective: Participation in physical activity has many advantages and yet the majority of women remain inactive. A possible reason for this is that women are faced with many different challenges every day of their lives and are continuously seeking the right work-life balance. Having a family and a career continues to be a liability for many women. This study investigated the perceptions of working women regarding their participation in physical activity.

Method: A quantitative research method was adopted and 350 questionnaires were administered to a purposive sample of working women in the Southern Gauteng province of South Africa. The final analysis was done on 160 respondents. In this study women employed in business organisations, working an average of 8 hours a day, five days a week comprised the sample. Arising from a comprehensive literature study, a two-part questionnaire was developed. The data were captured and analysed using SPSS (version 17). Descriptive statistics was conducted to describe the women that participated in this study and thereafter exploratory factor analysis was applied on the data.

Results: Arising from exploratory factor analysis seven factors was extracted: *coping and productivity, self-esteem, mental well-being, socialising, scheduling and relaxation*. The factors' internal consistency ranged from 0.735 to 0.929. The factor: *coping and productivity* produced the highest of the variance and indicates its importance regarding physical activity. Shank's (1986) study corroborates the believe that multiple roles are faced by many challenges that can easily result in the working women being last in line for any personal time

Conclusions: It was concluded that the predicament of working women in balancing their time between their multiple roles such as their jobs, family commitments and participating in physical activity proved to be an impediment. Recommendations were made on how to influence women's perception regarding their participation in physical activities.

Kim Nolte

Lecturer, University of Pretoria, South Africa.

Pieter E. Kruger

University of Pretoria, South Africa.

P. Shalk Els

University of Pretoria, South Africa.

Three Dimensional Musculoskeletal Modelling of the Seated Biceps Curl Resistance Training Exercise

The aim of this study was to evaluate whether three dimensional (3D) musculoskeletal modelling is effective in assessing the safety and efficacy of exercising on a seated biceps curl resistance training machine. The focus of the evaluation was on biomechanical and anthropometric considerations of the end-user. Three anthropometric cases were studied, representing a 5th percentile female as well as a 50th and 95th percentile male based on body mass index (BMI). Resistance on the biceps curl machine was set at fifty percent of the functional strength one repetition maximum (1RM) for each anthropometric case, two repetitions were performed. Results indicated that the LifeModeler™ default model was not adequate to solve the forward dynamics simulations and therefore adjustments had to be made to the default model to successfully complete the forward dynamics simulations. The software was able to sufficiently highlight the anthropometric differences with regards to the biceps curl machine's engineered adjustability in relation to the anthropometric dimensions of the studied cases, as the 5th percentile female could not be accommodated suitably on the machine. The unfavourable positioning of the small female did not appear to put her at increased risk for injury in comparison to the other two anthropometric cases. High recorded lumbar spine anterior/posterior (A/P) shear forces for the three anthropometric cases indicate that the seated biceps curl exercise may pose a risk for low back injuries. The male anthropometric cases were both above 1000 N and the 5th percentile female was slightly below (906 N). To conclude, it appears as if 3D musculoskeletal modelling can be used to evaluate resistance training equipment design such as the seated biceps curl machine however the limitations as indicated by this study must be taken into consideration especially when using the default Lifemodeler™ model.

Csaba Nyakas

Professor, Semmelweis University, Budapest, Hungary.

Physical Activity and Prevention: Effects of Selective Breeding for High Wheel Running Activity on Nutrition, Metabolism and Behaviour

Introduction: In the human population the genetic determinants of traits for development of obesity and its comorbidities is complex and the gene-environmental interactions make even further variable the outcome as individual phenotypes. One tool to investigate the complexity of inter-individual differences in a specific character in the laboratory is artificial selection. We used mouse lines that are selectively bred for the trait of high voluntary wheel running activity to study the metabolic, physiological and behavioral consequences in the offspring. The aim was to study responses to selective breeding for high voluntary wheel running activity in energy balance regulation and their contribution in the prevention of obesity and on the development of personality traits.

Methods: Behaviours and organismal physiology as complex traits were studied in male and female active and sedentary control mice. Body growth, food and energy intake, energy expenditure, food efficiency, food selection behaviour, resting metabolic rate, diet-induced obesity, motor activity in home cage were tested in one hand and exploration, fear, anxiety, spatial learning on the other. Hormones known to control food intake and metabolism (leptin, insulin, adiponectin) were also assayed, as well some brain neurotransmitter system functions.

Results: The highly active mice were hyperphagic but nonetheless resistant to diet-induced obesity (DIO), showed increased energy expenditure, higher non-exercise thermogenesis and fat oxidation when fed a high-fed (HF) diet. Control mice, on the other hand, were prone to develop DIO when subjected to the same HF diet. Behavioral consequences of selective breeding for high voluntary activity showed that mice with high activity levels responded differently in a novel vs. habituated environment. In a novel environment, they were more anxious, more explorative and risk-taking suggesting their level of carefulness and attentiveness was increased relative to non-selected mice. In a habituated environment, they had increased routine behavior, which probably helped them to sustain their physical endurance activity.

Conclusions: Selective breeding for voluntary physical activity is an appropriate tool to study potential co-adaptational changes, since

selective breeding for one trait could be linked to changes of several sub-ordinate traits that may determine individual variation in energy metabolism, susceptibility to diet-induced obesity and adaptive behaviour. Some of the physical activity co-adaptational physiological changes are highly beneficial like prevention of obesity, while others are more complex related to emotion and cognitive performance.

Fabiana Pomin

Researcher, Universidade da Coruna, Spain.

Milagro Ezquerro

Professor, Universidade da Coruna, Spain.

Itziar de Ozamiz

Researcher, Universidade da Coruna, Spain.

Differences in Perception of Body Image and Associated Psychophysiological Variables between Male and Female Athletes

We have studied the differences in body image perception and cardiovascular/electrodermal reactivities in athletes, men and women, by applying a test to evaluate the corporal image and silhouette scale. The heart rate and electrodermal conductance was measured in the sample ($n = 122$, age $M = 21.89$, $SD = 2.13$) during a task of body parts assessment and a range of silhouettes. We found that both men and women have a perception of their body image according to reality, a result that is not inconsistent with the hypothesis that, in general, women prefer a more thinner image to feel more attractive. Additionally, the image that women consider more attractive to the opposite sex is the same as men and vice versa. In particular, women focus on the lower body, weight and height, while men take care on their hair. No significant differences in heart rate reactivity and electrodermal conductance was found regarding to gender. However, greater changes in electrodermal conductance was found in women. Present results reveal the importance of the sex differences in the response to a body image evaluation: women seems to be physiologically more vulnerable to changes in the physical appearance domain.

Gongbing Shan

Associate Professor, University of Lethbridge, Canada.

Xiang Zhang

University of Lethbridge, Canada.

A Method for Quantifying Sensori-motor Function Related to Age and Evaluating Effectiveness of Various Physical Exercises for Seniors

Objectives: As the population ages, falls are becoming a major health problem, not only for those with some degree of balance/mobility impairment, but also among healthy active seniors. Previous studies suggest that the degradation of human sensori-motor function related to age contributes to falls. The aim of this research was to develop a practical solution for quantifying the age-related sensori-motor degradation and to use the method to study the influence of different physical exercises on aging. **Methods:** a new testing apparatus, the Dynamic Balance Testing Platform (DBTP), was developed for quantifying sensori-motor decline using Artificial Neural Network (ANN) modeling. A major advantage of ANN is its ability to address sensory redundancy and neural non-linearity. The DBTP consists of two layers - an immobile base and a mobile perturbation layer. The perturbation layer is balanced on a single center pivot; each of the four corners is supported by an air cylinder, with vertically downwards by a maximum of 2.5 cm. The platform was designed to reflect the natural oscillations in subjects' center of gravity (COG). Shifts in COG positions altered the load on each of the four supporting air cylinders, leading to measurable vertical displacements. The DBTP captures subjects' ability to balance dynamically on a single point of support, reflecting subjects' sensori-motor characteristics. Therefore, the measurements could be utilized to quantify sensori-motor functions. Using pre- and post-test approach, the DBTP could be used to evaluate the training effect of various excises. **Results and Conclusion:** ANN model, trained by 60 subjects' data (age: 18-65+), was developed for the DBTP. Seniors with and without Tai-Chi training were used to contrast any influence from Tai-Chi on the sensori-motor aging. The result demonstrated that Tai-Chi slowed down the effects of sensori-motor aging. This study validated that DBTP is a feasible tool in aging exercise studies.

Cristina Maria Stanescu

Associate Professor, Colentina University Hospital Bucharest, Romania.

Dan Stanescu

Clinical Institute Fundeni Bucharest, Romania.

Vasile Manoliu

University Politehnica Bucharest, Romania.

Kyriaki Branidou

Colentina University Hospital Bucharest, Romania.

G.H. Andrei Dan

Colentina University Hospital Bucharest, Romania

Cristina Chirion

Clinical Institute Fundeni Bucharest, Romania.

Claudio Stan

Clinical Institute Fundeni Bucharest, Romania.

Anca Dan

Colentina University Hospital Bucharest, Romania.

Cristian Baicus

Colentina University Hospital Bucharest, Romania.

Exercise Evaluation of Right Ventricle in Obesity – A Supine Exercise Echocardiographic and Radionuclide Study

Obesity is a strong predictor of cardiovascular disease. Exercise capacity (EC) in obesity is influenced by many factors including subclinical left ventricular (LV) dysfunction. Though right ventricular (RV) systolic and diastolic abnormalities may also interfere with EC in obese subjects, RV function is challenging to properly and accurately evaluate.

The aim of the study was to evaluate RV function at rest and during exercise by means of supine exercise echocardiography (SEE) and gated blood pool radionuclide ventriculography (GBPRV) in subjects with isolated obesity.

Methods: 81 subjects of either gender (mean age 39.1 ± 4.3 years) with a body mass index (BMI) > 30 Kg/m², who were free of hypertension, diabetes, dyslipidemia and organic heart disease, were included in the study. All subjects underwent a complete clinical, rest echocardiography and SEE examination and rest and exercise GBPRV. RV end-diastolic and end-systolic volumes (EDV, ESV), stroke volume (SV), ejection fraction (EF), peak ejection rate (PER) and peak filling rate (PFR) were measured at rest and during exercise and contractile reserve and diastolic function of RV were determined. The subjects were divided into three groups according to BMI (Group 1 with BMI 30-34.9 kg/m², group 2 with BMI

35-39.9 kg/m², group 3 with BMI ≥ 40 kg/m²). Results: The mean BMI was 36.48 ± 4.05 kg/m². In the pooled subject population we found significant correlations between BMI and most of the evaluated parameters. The following are the means, standard deviations and correlations with BMI: SV (86.25 ± 12.01 ml/beat, $r = -0.326$, $p = 0.003$), PER (3.14 ± 0.61 VTDi/s, $r = -0.253$, $p = 0.023$), PFR (3.05 ± 0.73 EDV/s, $r = -0.335$, $p = 0.003$), EFRV ($57.5 \pm 7.3\%$, $r = -0.335$, $p = 0.002$). From rest to peak exercise, SV increased with $20.81 \pm 4.52\%$, EFRV with $19.7 \pm 3.45\%$, PER with $18.44 \pm 2.30\%$, PFR with $18.46 \pm 2.65\%$. At the ANOVA post-hoc analysis of the 3 groups, SV, EFRV, PER and PFR variations were significantly different in group 3 compared with groups 1 and 2 ($p = 0.001$, 0.0001 , 0.014 and 0.001 respectively)

Conclusions:

1. The contractile right ventricular reserve and diastolic function at exercise may be impaired in otherwise healthy subjects with extreme obesity.
2. The right ventricle can be properly evaluated by radionuclidic ventriculography, mainly in obese subjects difficult to examine using ordinary imaging diagnostic techniques
3. Right ventricle dysfunction in obesity equally contributes to reduction of exercise capacity along with left ventricle dysfunction.

Linda Van den Berg

Lecturer, Tswane University of Technology, South Africa.

Anita E. Pienaar

Professor, North-West University, South Africa.

The Effect of Growth and Maturation on the Physical and Motor Abilities, as well as Rugby Skills of Early, Average and Late Developers: A Longitudinal Study

Objective: The aim of this study was to determine the effect of growth and maturation over a period of three years on the physical and motor abilities and rugby skills of talented young rugby players aged 15 to 18 years. Differences between early developers (ED) (n = 4), average developers (AD) (n = 13) and late developers (LD) (n = 1) were also assessed over the three-year period.

Methods: Flexibility, leg and back strength, muscle endurance, speed and aerobic endurance were measured using different standardized tests. Differences over the three-year period were analysed within and between groups using descriptive statistics, repeated measurements over time and two-way Analysis of Variance. An analysis adjusting for race and playing position was also performed to evaluate the role of these characteristics in the results.

Results: Results indicated no significant differences in physical and motor abilities or rugby skills of players between ages 15 and 18 years, although significant improvement was seen in flexibility and explosive strength of early and average developers. Furthermore race showed an effect on strength measurements (especially leg strength), and player position on leg strength and aerobic endurance, while the effect of late development seems to shrink as boys grow older.

Conclusion: The conclusion can be drawn from this study that potentially talented rugby players (divided into early and average developers) between ages 15 and 18 years do not differ in terms of their physical and motor abilities or rugby skills. The assumption from this study was that later developers would probably “catch up” with early developers and might even reach better performance potential in terms of physical and motor abilities as they grow older.

Vassilios Vardaxis

Professor, Des Moines University, USA.

Laura Covill

Des Moines University, USA.

Pain Effect on Physical Activity Profiles of Hip Osteoarthritis Patients

Objectives: Patients with hip osteoarthritis (OA) limit their activity levels secondary to pain. After total hip arthroplasty (THA), pain levels improve. Since pain is decreased, activity levels would most likely increase. Yet, activity levels may be related to daily habits and patients may self limit secondary to their previous longstanding physical impairments. The pain and activity profiles of patients with hip OA were compared to healthy cohorts with the objective to compare pain and activity levels pre and post THA.

Methods: Patients with endstage hip OA slated for THA and age matched controls were evaluated on 2 separate sessions (pre and post) 3 months apart; the OA group had THA shortly after the pretest. The activity profiles of all subjects were evaluated using actigraphy monitors (GT3X by ActiGraph), worn over the right hip during waking hours for 14 days (other than water activity times). The pain section of the Western Ontario and McMaster Universities Osteoarthritis Index and the Harris Hip scales were used to assess pain during everyday activities. Volume, rate, and time at sedentary, low, light, moderate and high activity level data were derived from the actigraphy monitors. Paired t-tests and independent samples t-tests were used to assess change in activity profile (pre vs post) within each group and between groups respectively.

Results: Patients noted decreased pain post THA similar to controls; changing from moderate pain to less than slight pain in both pain scales. The amount of activity, as reflected by volume and rate, from pre to post THA increased slightly, however, controls were considerably higher in both. The time spend at various activity levels from pre to post surgery changed indicating a reduction in sedentary time by 6% and an increase in the low and light activity level by 2% and 4% respectively. Compared to controls, the patients post THA demonstrated reduced moderate and vigorous activity levels.

Conclusions: Patients post THA have minimal pain and do increase their activity levels. Their level of activity does not increase to vigorous or moderate at 3 months post THA. Further analysis at 6 months and 12 months may yield different trends.

Theodore Vickey

Ph.D. Student, National University of Ireland at Galway, Ireland.

Can a Tweet Make you Fit?

Objectives: The purpose of this study was to research the new emerging technology of mobile health, the use of mobile fitness apps to share one's workout with their Twitter social network, the workout tweets and the individualities of the Tweeters.

Methods: 70,748 tweets from mobile fitness application Endomondo were processed using an online tweet collection application and a customized JavaScript to determine aspects of the shared workouts and the demographics of those that share.

Results and Conclusions: The data shows that by tracking mobile fitness app hashtags, a wealth of information can be gathered to include but not limited to exercise frequency, daily use patterns, location based workouts and language characteristics. While a majority of these tweets are to share a specific workout with their Twitter social networking, the data would suggest other reasons for sharing as well.

Yu-Lei Wei

Master Student, National Cheng Kung University, Taiwan.

Ching-Hsia Hung

Associate Professor, National Cheng Kung University, Taiwan.

Effect of Exercise Training on Heat Shock Protein 72 Expression in the Brain of Type I Diabetic Rats

Objectives: Diabetes mellitus (DM) is an important metabolic disease worldwide, and it causes many complications, such as micro- and macro-vascular diseases. Also, diabetes increases the risk of acquiring infections and developing sepsis. In our previous study, we found exercise could induce higher expression of heat shock protein 72 (HSP72) in heart and nucleus tractus solitarius (NTS), which reduced organ damage and attenuated cardiac dysfunction following endotoxemia. The purpose of this study is to confirm the role of HSP72 in the protection against endotoxin-induced damage. **Methods:** The diabetic rats were randomly assigned into sedentary groups, exercise groups, and HSP72 antisense with exercise groups. The antisense with exercise groups received antisense HSP72 oligonucleotide by the intracerebroventricular (ICV) injection once per week. The trained rats ran on treadmill 5 days/week, 20-60 min/day, at the intensity of 15-21 m/min over 4 weeks. All rats were sacrificed to remove the brain at 24 hours after the last training session. Western blotting was used to analyze HSP72 expression. In addition, we observed the changes of hemodynamic parameters in rats after administration of lipopolysaccharide. **Results:** We found that the expression of HSP72 in NTS was increased in exercise training groups. Additionally, lower HSP72 expression in NTS was found in antisense with exercise groups. **Conclusions:** These data showed that regular exercise training may increase HSP72 expression in brain and conferred protection against organ damage and cardiac dysfunction.

Antonio Williams

Associate Professor, Indiana University, USA.

Paul M. Pederson

Associate Professor, Indiana University, USA.

Building Brand Loyalty in the Fitness Industry

The fitness segment of the sport industry has received little attention in academic research (Lagrosen & Lagrosen, 2007). The limited research in this area is problematic because of the importance of an active lifestyle. For instance, while 97% of individuals from the United States say that it is important to maintain good health and 74% are satisfied with their physical health (Tharrett & Peterson, 2008), 65% of adults over 20 years of age are overweight. With the lack of consistency in perceptions of exercise compared to their actual health, there is a research gap that needs to be bridged. One way to fill bridge this gap is by examining the influence of branding in the fitness industry.

Objective: to further develop the measurement of brand associations in the context of health clubs by examining the relationship between service quality, exercise commitment, brand association, and brand loyalty.

Methods: data were collected from a sample of 148 members at a branded health club located in the Midwestern United States. Respondents completed a 68-item questionnaire to measure brand association, service quality, exercise commitment, and brand loyalty.

Results: The results of the exploratory factor analysis revealed ten brand association dimensions: product delivery, socialization, location/proximity, value/price, popularity, escape, logo, nostalgia, pride-in-place, and management. Additionally, results of the multiple linear regression supported the proposed theoretical relationship between service quality, exercise commitment, brand associations, and brand loyalty.

Conclusions: The findings of this study can be used to assist fitness and health club managers in building their brand, guiding their marketing strategies, and increasing consumer loyalty.