2015

The 10th National Convention on Sport Science of China

International Seminar and 1st Sino-Nordic Sport Science Forum

Sponsor: China Sport Science Society

Organizer: Zhejiang University

Nov. 8, 2015

Hangzhou, China

Contents

Schedule of International Seminar and 1st Sino-Nordic Sport Science Forum 1

Introduction of Speakers 2

Abstracts 7

Itinerary during the 10th National Congress on Sport Science of China 20

Map of Zhejiang University 21

Schedule of International Seminar and 1st Sino-Nordic Sport Science Forum

Date: November 8, 2015

Time: 8:30-11:30

Venue: East 1-107, Zhejiang University, Hangzhou, China

Chairman: Prof. Liwei Zhang, Beijing Sport University

Theme: Sport & Health

Presentation Title	Name
A Comparative Study of Youth Sport Participation in China and the U.S.	Hui Tian
Social and Emotional Learning in Sport and Exercise	Taru Lintunen
New Insight on Endurance Training and Intermediate Fasting	Kuno Hottenrott
Intelligent Physical Exercise Training at the Work Place for Health: Randomized Controlled Trials and Muscular Mechanisms	Gisela Sjøgaard
Rowing Exercise for Elderly Health	Mitsuru Higuchi
Study of MSDs Prevention Exercise Program on Farmers in Korea: Props Pilates Stability and Balance Exercise(PPSBE)	Hyejin Kim
Bimanual Arm and Hand Control after Incomplete Cervical Spinal Cord Injury	Laura Elizabeth Britten
Physical Activity and Pphysical Fitness of 6-19 yrs Children and Youth in China——Status and Trends	Mei Wang
Muscle Activity during Daily Life – Investigations on Sedentary Workers with and without Physical Activity	Taija Finni
(Un)intended Effects of hi-tech Modern Societies Leading to Physical Inactivity——and how to overcome	Jens Troelsen

Introduction of Speakers

Speaker: Hui Tian
Presentation Title: A Comparative Study of Youth Sport Participation in China and the U.S.
Speaker Introduction: Dean, Professor in the Department of Foreign Languages, Beijing Sport University, member of the Board of Directors of Beijing College English Research Association, Chair of Language Teaching Association of Sport Universities and Institutes and member of the Editorial Board, International Journal of Applied Sports Sciences, Korea. Her research interests include leisure and recreational sports, sports English, English linguistics, etc.

Speaker: Taru Lintunen
Presentation Title: Social and Emotional Learning in Sport and Exercise
Speaker Introduction: Professor of Sport and Exercise Psychology at the University of Jyväskylä, President of the Finnish Society of Sport Sciences, member of the Managing Council of International Society for Sport Psychology (ISSP). Her research interests include social and emotional learning, group phenomena in sport and exercise, self-perceptions and motivational processes in promotion of physical activity.

Speaker: Kuno Hottenrott

Presentation Title: New Insight on Endurance Training and Intermediate Fasting

Speaker Introduction: Executive director of the Department of Sports Science and Director of the Institute for Performance Diagnostics and Health Promotion at the Martin-Luther-University of Halle-Wittenberg, head coach of the young German Triathlon Union, and President of the German Association of Sports Science. His research fields include load, stress, and adaptation in sports, sensorimotor training, nutrition in sports, and etc.

Speaker: Gisela Sjøgaard

Presentation Title: Intelligent Physical Exercise Training at the Work Place for Health: Randomized Controlled Trials and Muscular Mechanisms

Speaker Introduction: Professor in the Department of Sport Sciences and Clinical Biomechanics, Faculty of Health Sciences, University of Southern Denmark, member of the scientific board for Centrum for Idrottsforskning and Vetenskapsrådet in Sweden, member of the Steering committee of the European College of Sport Science. Her research field includes Human exercise physiology, neuromuscular control and biomechanics.

Speaker: Mitsuru Higuchi

Presentation Title: Rowing Exercise for Elderly Health

Speaker Introduction: Professor in the Faculty of Sport Sciences, director in the Institute of Advanced Active Aging Research, Waseda University. He got the Award of Japanese Society of Physical Fitness and Sports Medicine in 1992; Japanese Society of Physical Fitness and Sports Medicine in 2002 and Japanese Society of Nutrition and Dietetics in 2002.

Speaker: Hyejin Kim

Presentation Title: Study of MSDs Prevention Exercise Program on Farmers in Korea: Props Pilates Stability and Balance Exercise(PPSBE)

Speaker Introduction: President of Somatic Pilates Association, CEO at e-Exercise Science Lab, and Ph.D. of Exercise Physiology and Hanyang University. She is a professional Advisory Commissioner in Agricultural Safety Model and Gyeonggi-do Agricultural Research.

Speaker: Laura Elizabeth Britten

Presentation Title: Bimanual Arm and Hand Control after Incomplete Cervical Spinal Cord Injury

Speaker Introduction: Lecturer in the Sport and Exercise Science Department at the University of Leeds, covering various topics in Motor Control and Sport and Exercise Psychology. Her primary research interests are focused on fine motor control, in the form of reaching and grasping, following incomplete cervical spinal cord injury, with the ultimate aim of improving rehabilitation strategies.

Speaker: Mei Wang

Presentation Title: Physical Activity and Pphysical Fitness of 6-19 yrs Children and Youth in China——Status and Trends

Speaker Introduction: Professor and Vice Director of Mass Sport Research Centre at China Institute of Sports Science, senior researcher of China Physical Fitness Surveillance Centre and member of Standing Committee of Health & Physical Fitness Association in China Sport Science Society. Her research fields include physical activity, physical fitness and health of children and adolescents.

Speaker: Taija Finni

Presentation Title: Muscle Activity during Daily Life – Investigations on Sedentary Workers with and without Physical Activity

Speaker Introduction: Professor of kinesiology at the Department of Biology of Physical Activity, University of Jyväskylä, board member in FSSS, council member in the International Society of Biomechanics and member of scientific committee in the European College of Sport Sciences. Her main research lines are muscle-tendon structure and function, and the significance of daily muscle activity.

Speaker: Jens Troelsen

Presentation Title: (Un)intended Effects of hi-tech Modern Societies Leading to Physical Inactivity——and how to overcome

Speaker Introduction: Associate Professor and Head of the Research Unit for Active Living at the University of Southern Denmark, board member of the Danish Institute of Sports Studies. His research interest is the association between the built environment and health, with a particular focus on active transportation and self-organized physical activity.

Abstracts

A Comparative Study of Youth Sport Participation in China and the U.S.

Hui TIAN

Beijing Sport University, China

Abstract

Objective: The purpose of this study isto compare youth sport participation in both China and the U.S. in terms of the purpose and rates of participation, different sports and activities, facilities and national policies and programs so that suggestions will be given for improving youth sports in China.

Method: Comparative analysis is used to compare youth sport participation in China and the U.S.

Results and Analysis

A survey conducted in 2014 in 10 provinces of China showed that 93.0% of the youth aged 6-19 participated in off-campus physical activities at least once a week, of whom 44.2% took part in recreational sports three times or more per week on average. When at school, about 60.0% of the students participated in extracurricular physical activities for at least twice per week, and 75.6% of the participants played sports with moderate or over intensity. While in the U.S., the 2013 nationwide participation report by the Sports and Fitness Industry Association(SFIA)showed that the age group 6-12, that is those who were born in the year 2000 or after had the highest participation rate for individual, team sports and outdoor activities with the participation rates being 49.8%, 53.1%, and 63.1% respectively. However inactivity (those who don't take part in any 'active'sport) rates have increased in the age groups such as 6-12 (19.5%) and 13-17(19.2%) , which was the highest since 2007.

The recreational sports or physical activities that the Chinese school students often participate in are those that can be played almost anywhere and don't necessarily require specific facilities or expensive equipment, such as running/jogging, games, rope skipping, shuttlecock kicking, soccer, basketball, volleyball, table tennis, badminton, etc.The Chinese students participated in sports mainly for the purpose of fun, fitness and health , and athletic skill learning. Compared with the Chinese children, the Americans have much better sport facilities and showed interest in different sports, with swimming the most popular one. Besides swimming, most of their interest lies in camping, martial arts,bicycling, running/jogging, soccer, fishing, hiking, basketball and canoeing, etc. Extreme sports are also very

popular among American youth. They participated in sports mainly for the purpose of enjoyment, athletic skill improvement, fitness and health, and a sense of belongings.

The governments in both countries have placed high priority on youth fitness and health, and have worked out national policies and programs to helpchildren to embrace a healthy and physically active lifestyle. In 1990, *School Physical Education Regulations*was issued by the Ministry of Education. In 1995, the *Law of the PRC on Physical Culture and Sports* was promulgated by the Chinese government, statingthat the country will further develop sports for the health of the Chinese people and that participation in sports is the right of every citizen. Ever since then, the Sport for All programs entered a new development era for the prosperity of recreational sports.In 2007,*Opinions on Strengthening Youth Sports and Building up Youth Health* was issuedby the State Council. All the educational institutions of China, especially primary and secondary schools have attached great importance to school PE. Programs for PE have been worked out to better implement *School Physical Education Regulations,* and efforts have been made to meet the *National Students Physical Fitness Standards*(modified version of 2014). Besides, the *Sunshine Sports Movement for School Students* has been launched in schools for the purpose of encouraging students to enjoy sports, nature, and sunshine. Students are encouraged to participate in recreational sports and activities for at least one hour each day and to participate in 20-30 minute organized physical activities during the break between classes. Similarly, *Healthy People 2020* made by the U.S. government states the importance of physical activities in improving youth health and fitness. The *2008 Physical Activity Guidelines for Americans* by U.S. Department of Health and Human Services (HHS) suggests that children should play sports for at least one hour each day. The National Association for Sport and Physical Education (NASPE) worked together with S&S Worldwide Inc. to support *Physical Best Program*,encouraging children to participate in sports and physical activities. Through *Carol M. White Physical Education Program*(PEP)the American enterprises provided financial support to physical education activities. Moreover, *The Presidential Youth Fitness Program* in 2012 encourages students to be active participants in sports and to enjoy a healthy lifestyle.

Conclusion and Suggestions

To sum up, the governments in both countries have made endeavors to encourage and support youth sport, knowing that recreational sport is an active and effective approach in improving youth health and fitness. In terms of recreational sports and physical activities, the Chinese children have different choices from the Americans owing to different interests and limited access to sport facilities, but students in both countries showed similar participation purpose. Therefore, suggestions are given for promoting youth sports in China. First, various ways need tobe developed in popularizing sports and their effects so that schools and parents will be aware of the importance of recreational sport participation and thereforeto encourage children to be active participants in team sports, through which students will not only become

physically fit but also learn to be disciplined and to abide by rules. Second, students should have easy access to sport facilities both at school and in community. Third, it will be a win-win program for enterprises to work together with schools, offering support to youth sport. Finally, further studies need to be conducted about the relationships between sport and health, sport and academic attainment, and sport and happiness so that more parents and children will actively engage in sports and physical activities.

Social and Emotional Learning in Sport and Exercise

Taru Lintunen

University of Jyväskylä, Finland

Abstract

The concept of social and emotional competence, which is a product of social and emotional learning (SEL), will be introduced in the context of sport and exercise. Research demonstrates that SEL promotes academic success, prevents antisocial behaviors, and enhances physical and psychological health. Sport has been proposed as an ideal context to promote personal and social developmental skills, however, few studies have examined the application of sport as an SEL platform. Social and emotional skills are not caught but need to be taught to coaches, teachers, sport instructors, and athletes through demonstration, modeling, discussions, reflections on one's experiences and practice. Mere sport and physical activity participation does not teach these skills. Even though physical education and most sport organizations have goals related to social and emotional skills, such as personal development, fair play and character education, coaches seldom seek to improve these skills by applying a specific method.Social and Emotional Learning seeks to address youth behavior by building five core competencies (i.e., self-management, self-awareness, social awareness, building positive relationships, and making healthy decisions). These competencies, in turn, should provide a foundation for better adjustment and performance as reflected in more positive social behaviors, less emotional distress, and improved success in sport and life. SEL programs also increase social and emotional development by establishing a safe and caring learning environment in which children and adults can be actively engaged in sports. The topic of SEL is critical because most youth sport organizations have social-emotional development as one of their primary goals, and they use such terms as social-emotional growth or life skills training. Examples of SEL related life skills programs and research done in the field will be introduced.

New Insight on Endurance Training and Intermediate Fasting

Kuno Hottenrott

Martin-Luther-University, German

Abstract

In the evolutionary history of the Homo sapiens it was quite normal to survive long periods without food and long periods foraging. To live for several days from the own energy stores is a inherited ability of mankind, without life could have not developed. Daily exercise and diet abandonment are over millennia proven physiological survival programs of humans.

In contrast, today's sedentary lifestyle with the constant availability of food for humans has to be interpreted as an evolutionary completely unfamiliar situation, which eventually led to many of the common wide spread diseases of the 20th and 21st centuries. There is high evidence that overeating and lack of exercise lead to a variety of cardiovascular and metabolic diseases such as hypertension, type II diabetes, obesity, and dyslipidemia.

A variety of Research done in the last couple years show that consciously controlled calorie restriction may contribute to a longer and healthier life. In this context are the findings of neuroscientists Professor Mattson and his team from the John Hopkins University really interesting. According to Mattson (2014) the previous focus in research has been mainly on how certain types of foods affect health. On the other hand, relatively little is known about a fundamental aspect of diet in terms of frequency and circadian meal times as well as potential benefits of intermittent phases with no or very low energy consumption.

It is the popular and wide spread eating habit in our modern society to consume three main meals and two snacks every day. This is not justifiable from an evolutionary perspective. Findings from studies with animal models and with humans show that intermittent phases of food restriction can benefit health and can counteract disease processes. The mechanisms include a metabolic conversion to fat metabolism, ketone body production and a stimulation of adaptive cellular stress reactions, which prevent molecular damage and help with molecular repair.

Based on these new findings, we developed a sustainable intermittent fasting program (IF) that optimizes frequency and timing of meals. These changes in eating habits combined with physical activity will stimulate health-promoting effects and improve the well-being.

We studied the effects of fasting intervals (half-day and full-day fasting) and endurance training on a variety of performance and health parameters in 84 obese women and men over a 12-week period. 9 participants withdrew from the study for various reasons prematurely.

A total of 73 subjects (87%) completed the program successfully. They got divided in two equal groups of which both completed the same extensive endurance running training.

In addition to the endurance training added the IFG = intermittent fasting group (n = 34) two fasting days per week while the nIFG (n = 39) was not fasting and followed a healthy diet based on the rules of the German Nutrition Society (DGE).

Standardized tests with the following results were performed immediately before the intervention and after 12 weeks:

In the IFG, the body weight decreased by an average of 7.5 kg, and the resting heart rate decreased from 76 to 63 beats/min, the blood pressure went from an average of 141/93 to 138/86 mm Hg, the abdominal girth decreased by 8 cm and endurance performance improved by 14%.

In the nIFG weight decreased by an average of 4.7 kg, resting heart rate decreased from 72 to 62 beats/min, blood pressure of 140/90 to 133/85 mm Hg changed, the abdominal girth decreased by 6 cm and endurance performance improved by 10%.

The effects of the change in endurance performance, the weight and body fat loss and waist circumference were significantly greater in the IFG than in the nIFG. In other words: intermittent fasting in combination with endurance training is more effective than endurance training without IF. A decline of this magnitude is associated with a significantly lower risk of disease.Intelligent physical exercise training at the work place for health: Randomized controlled trials and muscular mechanisms.

Intelligent Physical Exercise Training at the Work Place for Health: Randomized Controlled Trials and Muscular Mechanisms

Gisela Sjøgaard

University of Southern Denmark, Denmark

Abstract

Background: Physical exercise training at the work place may prevent lifestyle diseases such as cardiovascular, metabolic, and musculoskeletal disorders. However, conflicting results have been presented regarding the effectiveness of worksite physical exercise training on health promotion which is true within jobs with low as well as high occupational physical demands. Mode of exercise training seems crucial for attaining positive effects in specific job categories. Knowledge on muscular adaptations with worksite training is essential for optimal training planning.

Methods: In Denmark 12 RCT's have been conducted introducing exercise at the work place enrolling >3000 workers. The interventions lasted from 10 – 52 weeks and offered ~1 hr weekly supervised exercise during working hours according to the concept of Intelligent

Physical Exercise Training (IPET) that is based on evidenced sports sciences training principles and tailored to work exposure, employee health status, and physical capacity. The job groups included were: Office and computer workers (*1-4*), dentists (*5*), industrial technicians (*6, 7*), cleaning personnel (*8*), health care workers (*9*), construction workers (*10*), and fighter/helicopter pilots (*11, 12*). Questionnaire surveys and health checks including measures of maximal aerobic capacity were performed at baseline and follow-up. In particular office workers were studied thoroughly including blood and muscle sampling together with biomechanical muscle function measurements to monitor muscle adaptations.

Results: In all job groups significant improvements were documented regarding health outcomes and/or health risk indicators. These outcomes were job group specific: Neck pain was reduced among office and computer workers, industrial laboratory technicians, health care workers as well as fighter pilots and forearm pain was reduced among laboratory technicians. Relative aerobic capacity –a health risk indicator for cardio-vascular diseases- was improved among office and computer workers, health care workers, and construction workers. Further, blood pressure, blood cholesterol, and BMI – markers for metabolic disorders - were improved in several job groups. Additionally, a number of other improvements in physical capacities were evidenced such as increased muscle strength and balance control. In office workers the painful muscles showed adverse functional, morphological, hormonal, as well metabolic characteristics (*13-17*). The training of the painful muscles recovered maximal muscle activation and strength (*14*). Importantly, with strength training the improved functional capacity allowed for decreased relative muscle load during occupational repetitive work tasks (*18*). Metabolic capacity increased (*18*) as demonstrated even at the gene level (*19*), and morphological recovery was documented using advanced immunohistochemical stainings for e.g. satellite cells (*20*) and neuronal nitric oxide synthase (*13*).

Discussion: It is remarkable that in every study group outcomes of improved health were documented and the effect sizes were of clinical relevance, their magnitude in general being related to training compliance. Of note is that intensive muscle strength training did rehabilitate painful muscles, which has been proven in several randomized controlled trials. Three essential factors characterized these interventions which made them distinct from a number of unsuccessful interventions: 1) Physical exercise training was performed during working hours 1 hr per week, usually divided into 2-3 training sessions, which requested involvement of the employer to allow for such activities and thus signaling support of health enhancement for employees, 2) sports exercise training specialists were involved in designing the specific exercise training programs that were evidence based and of general high intensity, 3) training sessions were regularly supervised by expert trainees in the field and adherence was monitored. It is concluded that worksite exercise training does enhance health if a program with evidenced efficacy if implemented by expert trainees with support of the employer. Cost effectiveness estimates indicate acceptable cost relative to societal savings on health expenses. These novel findings can be envisaged to impact tremendously on future treatment and prevention at the work place.

Rowing Exercise for Elderly Health

Mitsuru Higuchi

Waseda University, Japan

Abstract

Aerobic exercise is recommended for the prevention of lifestyle-relateddiseases, while resistance exercise is recommended for the prevention of osteoporosisand sarcopenia. Both types of exercise are important in helping elderly people tomaintain quality of life. Rowing is one of the oldest sports in the world and it offersa combination of both aerobic and resistance exercise. Because rowing is practicedon a seat, less impact is placed upon the knee joints, making it safe for elderlypeople even if they are categorized as overweight or obese. Elderly rowers havehigher cardiorespiratory fitness (CRF) and a lower risk of coronary heart diseasescompared with age-matched untrained people. The bone mineral density and musclesize in rowers are also greater than in untrained people. After 6-month exercisetraining in elderly men using a rowing ergometer, CRF and muscle size increasedand the risk of lifestyle-related diseases also improved. An indoor rowing ergometerhas been developed which offers a safe and easy tool for exercise in elderly people,even those who are wheelchair-bound. Therefore, rowing could offer a beneficialcombination of aerobic and resistance exercises for achieving an active life in the elderly population.

Study of MSD Prevention Exercise Program on Farmers in Korea: Props Pilates Stability and Balance Exercise (PPSBE)

Sangnam Nam[1)], Hyejin Kim[1)], Ungryel Bae[2)], Hyunkyung Shin[1)]

Hanyang University[1)], Kookmin University[2)], Korea

Abstract

Musculoskeletal disorders (MSD) are among the most costly health care problems facing society in Korea. Farmers are exposed to MSD 2.4 times than healthy people. There are alternative solutions to prevent from MSD such as hospital treatment, physical therapy and movement education. Therefore, customized exercise is necessary for farmers to manage their health by themselves. General exercise can cause pain during exercise so that stability

exercise is needed for farmers with MSD to control pain. Stability Exercise such as Props Pilates Stability and Balance Exercise (PPSBE) focus on improving balance, flexibility, core strength, postural awareness and so on. The government policy of MSD Prevention has been implemented for farmers to improve working environment in Korea.

Over 3,000 farmers with MSD have participated in PPSBE program from 2008 to 2015. Female usually has more MSD problem than male. In order to gather sampling data on body stability and sensorimotor control ability before and after the exercise program, 180 female farmers aged 50 to 65 years old were chosen and this study employed MFT (Multi-Functional Training) device. They were asked to maintain standing balance on unstable surface, in the lateral setting and forward/backward setting. PPSBE regimen was undertaken 3 times a week for 12 weeks (1 for instructor's lecture, 2 for video lecture). PPSBE was consisted of 30-min Gymball, 30-min Foam Roller and 30-min Tubing in group.

The subjects were tested before and after the program. There was a significant improvement in body stability (BS) and sensorimotor control ability (SMC). Also, there are improvements of flexibility and strength, awareness of posture, and reduction of pain. These results suggest that PPSBE can be safely performed to farmers with MSD and lead to improve in stability and balance.

PPSBE can be safely performed by farmers with MSD. It leads to improved body stability and sensorimotor control abilities. The more farmers do PPSBE on a regular basis, the more they prevent the MSD symptoms and reduce pain by themselves in working condition and daily life. Further support will be necessary to maintain farmers' health education programs and to keep farmers healthy against MSD in future.

Bimanual Arm and Hand Control after Incomplete Cervical Spinal Cord Injury

Laura Elizabeth Britten

University of Leeds, Britain

Abstract

Despite regaining arm and hand function being the main priority for rehabilitation following injury to the cervical spinal cord, there has been limited research focusing on the control of upper limb movements, when compared to literature based on lower limb function and other clinical populations such as stroke. Reaching and grasping is a fundamental task of daily living and has been widely researched in non-injured adults and the stroke population, as it helps us to understand how the nervous system controls and coordinates multi-joint actions (shoulder, elbow and hand). Understanding the control of the upper limbs when reaching and grasping is of particular importance as it will help to guide future rehabilitation strategies e.g.

the use of bimanual therapy. My research aims to quantify how the upper limbs are controlled when individuals with an incomplete cervical spinal cord injury (icSCI) reach and grasp objects when compared to non-injured participants.

Eighteen participants with an icSCI, sixteen younger adults (YA) and sixteen older adults (OA) participated in the study, which involved reaching and grasping objects, varying in distance and size, in unimanual (one-handed) and bimanual (two-handed) conditions. Kinematic data (of the medial wrist, index finger and thumb) and Surface Electromyography data (Anterior Deltoid, Biceps Brachii, Triceps Brachii and Extensor DigitorumSuperficialis) was captured and analysed.

Kinematic data showed that participants with an icSCIproduced unimanual and bimanual movements of a longer duration and lower peak velocity, with an increased reliance on the deceleration and final adjustment phase when compared to non-injured participants. With regards to the grasp phase, participants with an icSCI produced maximum grasp aperture earlier in the movement and with temporal dissociation between the transport and grasp phases. Participants with an icSCI also showed novel muscle activity patterns when compared to non-injured participants supporting the notion of motor redundancy. Object distance and object size influenced both the transport and grasp phases of unimanual and bimanual prehension, resulting in control differences between participants with an icSCI and non-injured participants e.g. longer movement time and increased reliance on the final adjustment phase in participants with an icSCIwhen reaching and grasping large objects.

Finally, despite bilateral (both upper limbs) deficits of the arms and hands, participants with an icSCI showed evidence for retaining a level of bimanual coordinationbetween the limbs, such as using the final adjustment phase to improve synchrony (minimising the time difference) between the limbs. This supports the integration of bimanual movements into rehabilitation in order to improve arm and hand function, as well as the performance of activities of daily living, which are often bimanual in nature.

Physical Activity and Physical Fitness of 6-19 yrs Children and Youth in China ——Status and Trends

Mei Wang

China Instituteof Sport Science, China

Abstract

Objective: The primary aim of this research is to evaluate the overall physical activity and analyze the changes of physical fitness of children and youth in China, for providing

scientific basic for public health, sport service system policy-making and ensure the sustainable improvement of fitness in China

***Methods*:** From March to May in 2014, National Physical Fitness Surveillance center conducted a nation-wide survey of exercise among Chinese aged 6-69yr. The survey covers 10 provinces (or municipalities). Through multi-stage stratified random sampling and door-to-door interview, more than 243 streets and township were investigated. As part of the survey, the subjects of 6-19 year-old children and youth in urban and rural areas wereinterviewed. The valid samples of children and youth are 49308, and male and female in urban and rural are 12264, 12283, 12493and 12268 respectively. The core content of questionnaire for children and adolescents is physical exercise, also included daily routine, Physical Education and extracurricular Physical Activity Participation in Schools, physical activity after school and so on.

Data of Physical fitness come from the National Physical Fitness and Health Surveys among Chinese Students in 1985, 1990, 1995, 2005 and 2010.

***Results*:**

1) 99.7% of children and youth in China participate in physical exercise weekly (included PE class, extracurricular and after school physical exercise).

2) There were 14.4% of children and youth whose physical activity level attained the global recommendations on physical activity for health (should accumulate at least 60 min/d moderate to vigorous physical activity (MVPA)), with 20% among 6-12 year-olds and 11.9% among 13-18 year-olds. 18.9% of the whole respondents do vigorous-intensity physical activity at least 3 times/week. With 19.2% youth and 18.3% children respectively.

3) 60% of children and youth were involved inextracurricular physical activity above 2 times a week (not included Morning and Class-break setting-up exercise).In which 75.6% of Children and youth had MVPA. Sports are similar with PE learning contents.

4) Percentage of Children and youth participating in physical exercise after-school is 93.4%, 77% reported more than twice per week. With the proportion 57.2%, the duration of 30 to 60 minutes each time ranks the highest of physical exercise participating with moderate intensity. The main sports are running, rope skipping, sport games, football, basketball, table tennis, badminton and tennis etc.

5) Only about a quarter of children and youth who participate in organized sport (sport club) and/or physical activity programs in their spare time. On the contrary, Chinese adolescent focused oncultural tutoring sessionsmost likely in their leisure time. Self-reported average time spent in outdoor active play is 6.1 hour per week, there are 72.9% children and youth active play for less than 60 min per day.

6) 58.8% of children and youth using active transportation to get to and from school by cycling or on foot, 73.1% of them spent less than 30min. Child and youth in rural areas were far more active than urban in areas (OR=1.12, 95%CI 1.09,1.16)

7) Over the past 25 years, children and adolescent's height, weight and chest circumference were substantially increased. Cardiopulmonary endurance declined. The muscles strength of the children and adolescents' increases in different degrees in the past

25 years. The speed of 50m running of male students showed an increasing trend, while the female students showed a decreasing trend.The flexibility among both children and adolescents showed declining trend from 1985 to 2000 in our country, from 2005 to 2010--male students' showed decreasing trend and the female students' showed an increasing trend.

Conclusion:The proportion of Chinese children and youth whose PA level meeting the PA guidelines was relatively low, and low participation in vigorous intensity physical activity.

It's still needed to strength physical activity promotion for Chinese adolescent, the construction of exercising place, as well as youth club or Camp and sport organizingfor children.

Muscle Activity during Daily Life – Investigations on Sedentary Workers with and without Physical Activity

Taija Finni

University of Jyväskylä, Finland

Abstract

Recent findings suggest that not only the lack of physical activity, but also prolonged times of sedentary behaviour wheremajor locomotor muscles are inactive, significantly increase the risk of chronic diseases. By measuring quadriceps and hamstring muscle inactivity and activity patterns during normal daily life of ordinary peopleusing novel EMG shorts (Finni et al. 2007) my group has shown that the main locomotor muscles areinactive over 7 hours, and only a small fraction of muscle's maximal voluntary activation capacity is used averaging only4% of the maximal recruitment of the thigh muscles. Some daily non-exercise activities such as stair climbing produce muchhigher muscle activity levels than brisk walking, and replacing sitting by standing can considerably increase cumulative dailymuscle activity (Tikkanen et al. 2013, 2015). In a randomized controlled trial where office workers were given one counseling sessionto reduce sitting time, the workers were able to reduce muscle inactivity time by 33 min, which was reallocated to21 min of light muscle activity. During work time, average muscle activity amplitude increased by 13%, reaching an average of 1.8%of maximal voluntary contraction (Pesola et al. 2014). By comparing office workers in their habitual working environment using either sit or sit-stand workstations we have shown that the office worker having with sit-stand workstations had ~15% less muscle inactivity time, ~11% more light muscle activity time and reported ~42% lower musculoskeletal discomfort, but had the same amount of spinal shrinkage as compared to office workers using sit workstations during a normal work day (Gao et al. submitted). While environmental changes by implementing electronically adjustable sit-stand workstations at workplaces can

be effective, it is likely that promoting the daily use of sit-stand workstation by counselling, the positive effects could be more substantial since less than 50% of the people having sit-stand workstations use them on daily basis (Gao et al. 2015).While posture change from sitting to standing induces small but significant increase in muscle activity, it can have important health consequences.In a cross-sectional design we found clinically significant differences in HDL cholesterol and triglycerides in people having low muscle inactivity time, independent of moderate- to vigorous-intensity muscle activity (Pesola et al. 2015). These findings of significance of low level activities may be utmost important since even exercise for fitness may not reduce daily sedentary time. Weexamined within an individual whether exercise alters thetime of muscular inactivity within his/her normal dailylife and found that while exercise increased moderate to vigorous level muscle activity and energy expenditure, it did not reduce muscle inactivity significantly (Finni et al. 2014). Therefore, it is concluded that even physically active individuals may benefit from light-intensity activities that reduce ubiquitous muscle inactivity time.

(Un)intended Effects of hi-tech Modern Societies leading to Physical Inactivity – and how to overcome

Jens Troelsen, Lars Breum Christiansen, Charlotte Klinker, Henriette Bondo Andersen, Charlotte Pawlowski, Jasper Schipperijn

University of Southern Denmark, Denmark

Abstract

Physical inactivity poses a threat to public health. Next to smoking physical inactivity is considered to be one of the top challenges to overcome in the 21st century.

Promoting Active Living is a way forward overcoming this challenge. Active Living is about how we integrate physical activity into our everyday living – during work, leisure and transportation. Active living is a way of life that incorporates physical activity into your everyday routines, such as walking to the store or biking to work.

To promote an active living lifestyle we need to do better urban planning, we need to redesign buildings; we need to rethink our traffic infrastructure. In general, we need to reconfigure our built environment.

For seniors this means age-friendly cities with for example many safe pedestrian crossings and benches to make a short break. For the working age population we must offer flexible solutions making it easy toexercise during the working day, setting up walk'n'meetingsor just taking the stairs instead of the elevator.

For children we have to build schools and daycarecenters with appealing physical

environment and trained staff to introduce the children to funny, motivating, active learning spaces.

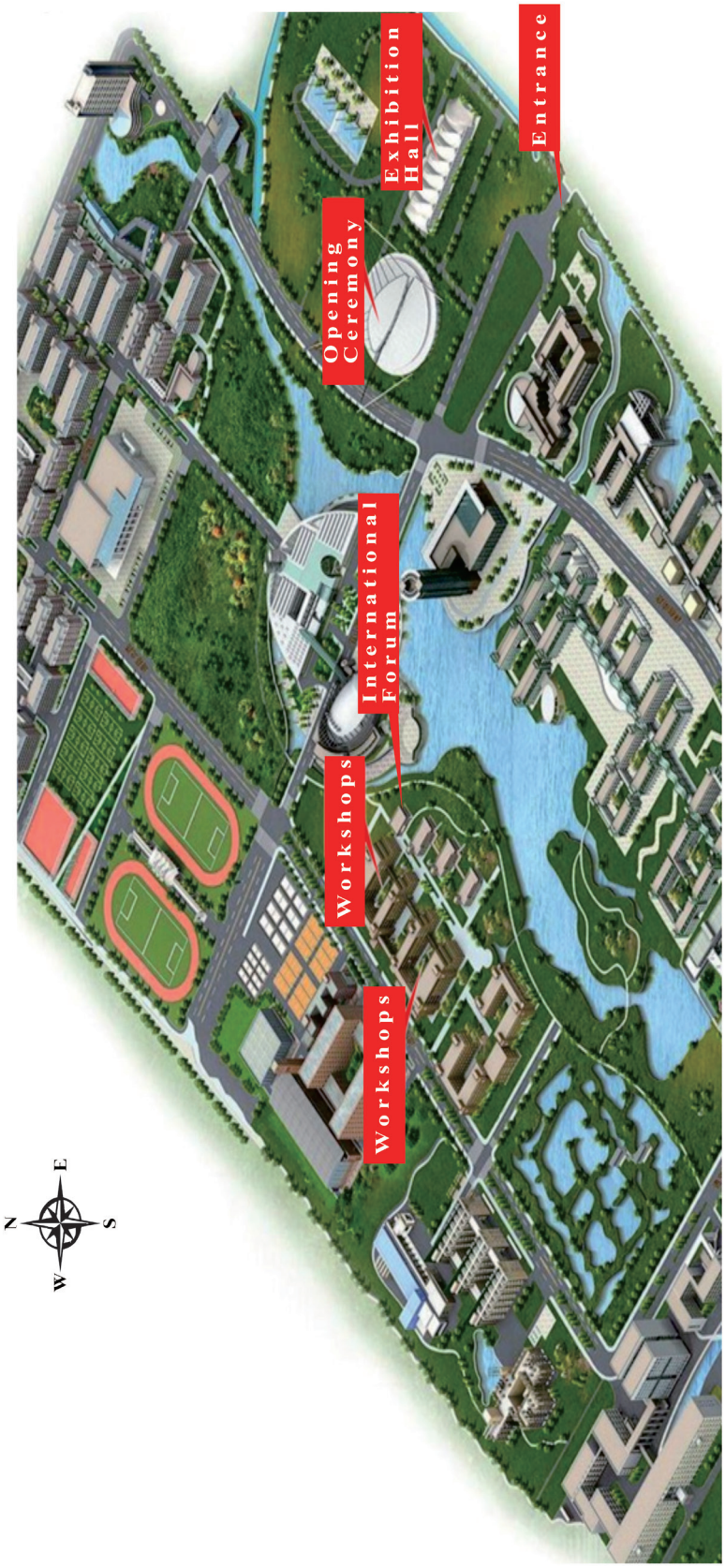
The presentation will give examples of active living environment and present result from research projects carried out by the Research Unit for Active Living. The Active Living Research Unit has developed substantial methodological knowledge on how to collect and analyse objective measurements based on combined accelerometer- and GPS-data. By merging data we are able to detect intensity and duration of physical activity in an everyday settings, and additional geo-coded where the physical activity or inactivity takes place. Examples of domain analyses are presented illustrating how and where physical activity is distributed in relation to leisure, occupation, education, and transportation domains. More detailed sub-domain analyses will also be included illustrating the use of parks, schoolyards, cycle infrastructure, sport facilities e.g.

The Active Living Research Unit is first movers using this methodological approach and analytic framework, and it is in the international research society considered to be cutting-edge knowledge in the future active living research.

Itinerary during the 10th National Congress on Sport Science of China

Date	Time	Event	Venue
Nov 5 to 6		Check-in	Zijingang International Hotel
Nov 6	14:00-15:00	Opening Ceremony	Gymnasium, Zhejiang University
	15:00-17:30	Keynote Presentations	Gymnasium, Zhejiang University
Nov 7	8:00-18:00	Sightseeing	West Lake, Lingyin Temple
Nov 8	8:30-11:30	International Seminar	East 1-107, Zhejiang University
	Afternoon	Free Time	
Nov 9 and after		Check-out	

Map of Zhejiang University



International Seminar and
1st Sino-Nordic Sport Science Forum