

Programme and Abstracts



University of
Bedfordshire

ISPAR

Institute for Sport & Physical Activity Research

2017 | Conference



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Welcomes

Following the big success of the inaugural ISPAR Conference, I know we are all looking forward to the second iteration. Enjoy hearing about the great research that staff and post-grads are doing right now and celebrate the difference the institute/school makes to athletes and the wider population.

Dr Sally Bentley
Executive Dean, Education and Sport

On behalf of the Institute for Sport & Physical Activity Research, welcome to the second Annual ISPAR Conference.

The conference is packed with high quality content and insight, with an excellent variety of topics and presentation formats, from oral presentations, poster presentations to 3-minute theses.

There will be opportunities for networking and I hope you renew acquaintances and make new contacts with a view to exploring new research opportunities. I hope you take the time to share your knowledge and expertise with other delegates and leave feeling inspired and energised. Enjoy the event.

Dr Andrew Mitchell
Head of School, Sport Science & Physical Activity
Acting Director, Institute for Sport & Physical Activity Research

Programme *12:30 registration and poster set-up, G0.01	
12.45-13.00	Welcome Speaker: Dr Andrew Mitchell, Acting Director of ISPAR
13:00-13:30	Speaker: Corey Beecher Cardiac Exercise Specialist Keynote: <i>Physical activity in action: the perspective of the practitioner and the client</i>
13:30-13:40	Speaker: Dr Helen Ives & Dr Toni O'Donovan Chair: Dr Joanne Hill <i>Virgin Active Playmakers: working with corporate sponsors</i>
13:40-13:50	Speakers: Kevin Wyld & Charlotte Stringer Chair: Dr Joanne Hill <i>Introduction to Diabetes Exercise Clinic</i>
13:50-14:00	Speaker: Dr Louise Douse Chair: Dr Joanne Hill <i>Moving experience: an investigation of embodied knowledge and technology for reading flow in improvisation</i>
14:00-14:45	COFFEE BREAK and POSTER SESSION Gateway reception and lobby area
14:45-14:55	Speaker: Benjamin Maylor Chair: Dr John Hough <i>Effects of interrupting prolonged sitting with high-intensity physical activity compared with an isocaloric bout of continuous moderate-intensity physical activity on appetite and energy intake</i>
14:55-15:05	Speaker: Michael Harrison Chair: Dr John Hough <i>Examination of the exercise-induced salivary hormonal responses to an overreached state</i>
15:05-15:15	Speaker: Charlotte Burton Chair: Dr John Hough <i>Use of the sit-to-stand task to screen for sarcopenia</i>
15:15-15:25	Speakers: Aisling O'Regan & Shanice Pryce-Royal Chair: Dr John Hough <i>Comparison of daily and intermittent breakfast consumption on physical activity energy expenditure in girls</i>
15:25-15:35	Speaker: Diane Cottrill Chair: Dr John Hough <i>The effect of a hot environment on appetite and appetite-regulatory hormones in adult males during rest</i>

15:35-15:45	Speaker: Michelle Flemons Chair: Dr John Hough <i>Occupational socialisation and the subjective warrant of physical education teachers</i>
15:50-16:05	COFFEE BREAK Gateway reception and lobby area
16:05-16:10	Speaker: Matthew Horner Chair: Dr Julia Fruer <i>The effect of environmental temperature during exercise on gut hormones, appetite and energy intake</i>
16:10-16:15	Speaker: Stephanie White Chair: Dr Julia Fruer <i>Associations of sedentary behaviour patterns with cardiometabolic risk in children</i>
16:15-16:20	Speaker: Diana Soares Chair: Dr Julia Fruer <i>Biomechanical feedback to improve balance and stability in an ageing population</i>
16:20-16:25	Speaker: Chris Long Chair: Dr Julia Fruer <i>An investigation of the kinetic and kinematic variables related to stability in elite rugby union players</i>
16:25-16:30	Speaker: Kamalesh Dey Chair: Dr Julia Fruer <i>Total sedentary time in South Asian and Caucasian adults: a systematic review</i>
16:30-16:35	Speaker: Lucie Mugridge Chair: Dr Julia Fruer <i>The feasibility of MyHealthAvatar mobile phone application for reducing prolonged sedentary behaviour and improving glucose control in Type 2 diabetes</i>
16:35-16:40	Speaker: Marsha Brierley Chair: Dr Julia Fruer <i>Development and evaluation of a workplace intervention to reduce prolonged sedentary behaviour</i>
16:40-16:45	Speaker: Jonathan Mills Chair: Dr Julia Fruer <i>Leading by example: leading a PE department into models based practice</i>
16:50-17:00	Speaker: Dr. Andrew Mitchell Head of School, Sport Science and Physical Activity Acting Director, Institute for Sport and Physical Activity Research Awards presented for the 'Best Student Oral Presentation' and 'Best Student Poster Presentation' CLOSE



Welcome to the Institute for Sport and Physical Activity Research (ISPAR)

ISPAR embraces a wide range of multi-disciplinary perspectives from the life and biomedical sciences to the social sciences, to seek solutions to the physical inactivity epidemic and enhancement of human performance in a variety of sectors related to sport, education, health and wellbeing.

Our work spans the life-course, working with children and young people, often in a school setting, through to adults and older adults within community, workplace and health care settings. We would be delighted to work with you on your research, training and consultancy needs and encourage you to get in touch. All staff contact information is available here: <http://unibeds.info/SSPAstaff>

Dr Andrew Mitchell, Acting Director of ISPAR
Dr Angel Chater, Deputy Director of ISPAR

ISPAR Themes

Institute for Sport and Physical Activity Research								
Centre for Physical Education, Sport & Human Movement			Centre for Health, Wellbeing & Behaviour Change			Centre for Physical Activity & Sports Performance		
Lead: Dr Joanne Hill Deputy: Dr Toni O'Donovan			Lead: Dr Angel Chater Deputy: Dr Lindsey Smith			Lead: Dr Daniel Bailey Deputy: Dr Iain Fletcher		
Pedagogy & Youth Sport	Education & Sport Policy	Socio-Cultural Studies	Sport, Physical Activity & Health Psychology	Behaviour Change Intervention Design & Comm.	Prevention & Management of Chronic Disease	Sports Performance & Biomech.	Physiology of Sedentary Behaviour	Physical Activity, Nutrition & Metabolism
Lead: Dr Claudio Farias	Lead: Stuart Wilson	Lead: Peter Craig	Lead: Dr Steve Kozub	Lead: Dr Angel Chater	Lead: Dr Lindsey Smith	Lead: Dr Iain Fletcher	Lead: Dr Daniel Bailey	Lead: Dr Julia Fruer
Members: J Hill T ODonovan M Flemmons S Keyworth D Pears D Golding M Bowler P Sammon H Ives A Stewart L Croft	Members: H Ives A Chater T ODonovan	Members: J Hill A Jones P Wu A Stewart S Robinson	Members: D Golding D Pears C Birtwisle A Chater	Members: D Bailey L Smith D Kukucska P Craig T ODonovan S Wilson	Members: A Chater D Bailey L Smith D Kukucska K Wyld D Hewson	Members: J Aldous A Mitchell L Charalambous K Wyld J Richards J McKeown	Members: J Fruer L Smith A Chater L Croft	Members: D Bailey J Hough A Chater L Croft L Smith



Oral Presentations

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Effects of interrupting prolonged sitting with high-intensity physical activity compared with an isocaloric bout of continuous moderate-intensity physical activity on appetite and energy intake

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A continuous bout of moderate-to-vigorous physical activity (PA) can suppress appetite, often resulting in an acute exercise-induced energy deficit not compensated for in a subsequent increase in energy intake. However, the effects of interrupting prolonged sitting with short bouts of high-intensity PA on short-term appetite are unknown. The present study examines the effects of interrupting sitting with short bouts of high-intensity PA versus a continuous bout of moderate-intensity PA on appetite and energy intake. Fourteen habitually inactive adults (seven female) completed three, 8-h experimental conditions in a randomised counterbalanced order: 1) uninterrupted sitting for 8-h (SIT), 2) a 30-min moderate-intensity PA bout (60% $\text{VO}_{2\text{R}}$ ($\text{VO}_{2\text{max}} - 3.5\text{ml/kg/min}$)) performed in the morning followed by uninterrupted sitting (CONT-SIT), and 3) sitting interrupted with hourly with 2-min 32s high-intensity PA bouts (85% $\text{VO}_{2\text{R}}$) (SIT-ACT). The PA performed in CONT-SIT and SIT-ACT was matched for energy expenditure. Participants consumed 15% and 30% of estimated daily energy requirements at 0 h and 4 h. Subjective appetite was assessed every 30 min. At 8 h, participants were given 30-min access to an *ad libitum* buffet meal. Buffet energy intake was calculated by weighing food items before and after participants ate. Relative energy intake (REI) was calculated by deducting activity energy expenditure (AEE) from buffet energy intake. Linear mixed-effects models were used to compare REI and appetite between conditions. Data are presented as mean [95%CI]. AEE was similar between SIT-ACT and CONT-SIT ($p=0.236$). REI was significantly lower in SIT-ACT (3092 [2367-3818] kJ) than SIT (3852 [3134-4569] kJ; $p=0.024$). REI for CONT-SIT (3290 [2565-4015] kJ) was not different to SIT or SIT-ACT ($p>0.05$). Overall appetite AUC ($\text{mm}\cdot 8\text{ h}^{-1}$) was significantly lower in SIT-ACT (407 [334-481]) than CONT-SIT (457 [383-531]; $p=0.047$), but did not differ to SIT (410 [336-484]; $p=1.00$). Interrupting sitting with hourly high-intensity PA bouts does not increase subjective appetite and induces an energy deficit that is not compensated for following a subsequent meal. In contrary, a continuous moderate-intensity PA bout followed by uninterrupted sitting increased subjective appetite, although this was not accompanied by an increase in energy

These findings suggest that interrupting sitting with high-intensity PA may suppress appetite when compared to a single continuous energy-matched moderate-intensity bout. Future research is required to determine the effects of interrupting sitting with high-intensity PA on appetite and weight management in the long term.

Examination of the exercise-induced salivary hormonal responses to an overreached state

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An imbalance between training load and recovery can potentially lead to overreaching and the overtraining syndrome (OTS) (Meeusen *et al.*, 2013). Diagnosis and prevention of these states in athletes still remains equivocal and establishing a reliable biological marker is required (Meeusen *et al.*, 2013). Exercise-induced hormonal (cortisol and testosterone) responses have been highlighted as potential markers (Meeusen *et al.*, 2010; Hough *et al.*, 2011, 2013). The University of Bedfordshire laboratory has developed a short-duration (30-min), high-intensity running test that elicits reliable exercise-induced elevations of cortisol and testosterone when in a normal trained state (Leal D., 2016) PhD study in preparation for publication). This exercise tool should highlight any blunted cortisol and testosterone exercise-induced responses that may occur when in an overreached state. It is now required to test this exercise tool and the induced hormonal responses elicited by this exercise when an individual is overreached. The present study examined salivary cortisol and testosterone responses to a 30-min, high-intensity running bout before and after a 12-day intensified training period. Ten active males will complete the study. Each participant will complete 18 laboratory visits in total; a familiarisation trial, two main trials, two graded exercise tests and a 12-day intensified training period. The main trials will consist of a 30-min self-paced continuous run on the treadmill with alternating blocks of 1-min at 11-RPE and 4-min at 15-RPE (Treadmill_{RPE}) and a 10-km TT separated by one hour recovery. Unstimulated saliva samples will be collected pre, post and 30-min post the Treadmill_{RPE} and assessed for salivary cortisol and testosterone. Recovery-Stress Questionnaire (RESTQ-76) and URTI questionnaires will assess mood status. The 12-day intensified training period will consist of; (a) 90-min continuous run (b) 5-km TT (c) 70-min self-paced continuous run. Statistical analyses will be performed using IBM SPSS

Statistics Version 22 (SPSS Inc., Chicago, IL). Ethical approval has been granted and data collection commenced in October 2016. Six participants have completed the study, the seventh participant is currently completing the study and the remaining participants are being recruited with the aim of completing data collection by June/July 2017. Salivary cortisol and testosterone responses to the 30-min high-intensity running bout (Treadmill_{RPE}) could highlight the hormonal alterations before and after a 12-day intensified training period. Therefore, these alterations could establish a reliable biological marker to diagnose and prevent overreaching and the OTS.

Use of the sit-to-stand task to screen for sarcopenia

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Sarcopenia is defined as the age-associated loss of skeletal muscle mass, muscle strength and physical function (Cruz-Jentoft, *et al.*, 2010, Age and Ageing, 39 (4), 412-423). The European Working Group on Sarcopenia in Older People (EWGSOP) highlight three measurable variables of the condition, which are; muscle mass, muscle strength and physical performance. There are recognised gold standard measures for each of these variables; however, currently there is no consensus agreed diagnosis method for sarcopenia. The sit-to-stand (STS) task is one of the most commonly used tests of physical function in older populations. The STS task is a suitable measure of muscular strength (Csuka and McCarty, 1985, American Journal of Medicine, 78 (1), 77-81) and has the potential to predict muscle power (Takai *et al.*, 2009, Journal of Physiological Anthropology, 28 (3), 123-128, and Smith *et al.*, 2010, Clinical Interventions in Aging, 5, 173-180). Therefore, the aim of this study is to validate the use of the STS task as a measure of muscle mass, muscle strength and power and physical performance in screening for sarcopenia, compared to gold standard measures, in older adults aged 65 years and over. Forty community-dwelling adults, aged 65+ will be recruited for this study. Lean body mass and appendicular lean mass of the participants will be measured using both the dual energy x-ray absorptiometry (DEXA) and diagnostic ultrasound. Participants will perform a 5-minute warm up on the cycle ergometer, at 50 watts and 60-80 revolutions per minute (RPM). Muscle strength and power of the participants will be measured using the isokinetic dynamometer, the handgrip strength

dynamometer and the hand-held dynamometer. Four tests of physical function will be performed, including the five-times STS, the 30-second STS, the timed up-and-go, and usual gait speed. Ethical approval for this study will be submitted by the end of May, both to the NHS via IRAS for the use of the DEXA and to the University Ethics Committee. Once this has been submitted, pilot testing will commence to test the reliability and validity of the aforementioned measures. The STS task can be used as a simple screening tool for sarcopenia. This can be utilised within the community setting for the initial screening of the condition. If sarcopenia is detected earlier and quicker, there is more chance of an effective intervention and treatment plan.

Comparison of daily and intermittent breakfast consumption on physical activity energy expenditure in girls

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Skipping breakfast and physical inactivity are both global health concerns in young people, particularly in adolescent girls. More frequent breakfast consumption has been associated with higher physical activity (PA) levels in children and adolescents. However, the causal effect of breakfast consumption frequency on PA has not been studied in young people. The aim of this study was to examine the effect of daily compared with intermittent breakfast consumption on physical activity energy expenditure (PAEE) in adolescent girls. Using a randomised crossover design, 27 girls (age 12.4 ± 0.48 y, BMI 19.3 ± 3.0 kg·m⁻², peak oxygen uptake 47.1 ± 9.0 mL·kg⁻¹·min⁻¹) completed two, 7-day conditions: daily breakfast consumption (DBC), which involved consuming a ~1668 kJ standardised breakfast every day, and intermittent breakfast consumption (IBC), which involved consuming the breakfast on three intermittent days with four days of breakfast omission. Combined heart-rate accelerometry was used to estimate PAEE throughout each condition. Statistical analyses were completed using condition by time of day repeated measures analysis of variance. Daily PAEE from sedentary, light, moderate and vigorous intensities did not differ between the conditions ($P \geq 0.131$). The condition by time of day interaction for sedentary time was significant ($P=0.048$), indicating that the girls spent 11.5 min/day more time sedentary in IBC compared with DBC during 1530 h-bedtime ($P=0.038$; $d=0.18$). Light PA was 19.8 min/day higher during DBC compared with IBC ($P=0.054$; $d=0.22$), which was accumulated during the wake-10:30 h

($P=0.036$; $d=0.22$) and 15:30 h-bedtime ($P=0.026$; $d=0.31$) time segments. Time spent in MPA and VPA was not affected by condition regardless of the time of day ($P\geq 0.187$). Adolescent girls spent more time in light PA in the morning and after school and spent less time sedentary after school when a standardized breakfast was consumed daily compared with intermittently across seven days. However, breakfast manipulation did not affect PAEE. The causal link between breakfast consumption and PA requires further research in adolescent girls.

The effect of a hot environment on appetite and appetite-regulating hormones in adult males during rest

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Appetite is reduced to a greater extent following acute exercise in a hot environment compared with colder environments. However, the effect of temperature on appetite, appetite-regulating hormones and energy intake (EI) at rest has not been investigated. Therefore, this study aims to examine the effect of resting in a hot environment (30°C) and thermoneutral environment (20°C) on energy intake, appetite and appetite-regulating hormones in men. Using a randomised cross-over design, 13 healthy men were recruited and completed two conditions in a counterbalanced order: hot (30°C) and thermoneutral (20°C). The conditions consisted of resting for 5.5 h in an environment chamber. A standardised breakfast was served immediately upon participant entering the environment chamber and an *ad libitum* pasta meal was served at 4 h. Blood samples were collected at 0 (fasted), 0.5, 1, 1.5, 2, 3, 4, 5 and 5.5 h to determine acylated ghrelin and peptide YY (PYY) concentrations. Perceptions of appetite were assessed using 100-mm visual analogue scales every 30 min. Core temperature and heart rate were also monitored the conditions. Energy intake was 23% lower in the hot (30°C) environment when compared to the thermoneutral (20°C) environment ($P\leq 0.0005$). There was no effect of condition on acylated ghrelin ($P=0.770$) and PYY ($P=0.113$). Perceived appetite was not significantly different between the conditions ($P\geq 0.359$), but, as expected, hunger, satiety, fullness, and prospective food consumption changed over time ($P<0.0005$). The results suggest that a hot (30°C) environment reduces energy intake when compared to a thermoneutral (20°C) environment, but this may not be mediated by changes in appetite-regulating hormones. Future research is required to determine whether eating in hotter environments could be

beneficial for treating obesity.

Occupational socialisation and the subjective warrant of Physical Education teachers: Does the subjective warrant still have currency in 21st century Physical Education

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The subjective warrant has a direct relationship with the conception of beliefs related to perceptions of physical education and how it should be delivered in schools. These beliefs are developed before students enter Physical Education Teacher Education (PETE) Programmes. Identifying whether the concept of the subjective warrant still has currency in the 21st Century might help to further understand the occupational socialisation process of physical education teachers. It also provides a solid foundation to ensure PETE programmes impact on teacher beliefs, attitudes which in turn can impact on teacher behaviour and pedagogy. These factors affect pupil learning in physical education. An interpretative framework was used for this qualitative research study using naturalistic methods of enquiry investigating students' construction of reality. The meanings that one attaches to events, experiences, and the construction of beliefs and perceptions in relation to these were uncovered. A systematic review of literature on the occupational socialisation of teachers and the subjective warrant for teaching physical education was conducted to determine why teachers have historically chosen to enter the profession. Fifteen pre PETE recruits enrolled on two PETE courses at one university were selected using purposive sampling. Semi-structured life story interviews were conducted and transcribed. Thematic analysis was used to organise, interpret and manage the data. Recurring themes, phrases and concepts were categorised, coded and classified. Categories were identified through the literature review based on the subjective warrant. Bourdieu's concepts of habitus, field, practise and capital were used as 'thinking tools' to underpin this study. Physical education is based ideology rather than a philosophy due to the inter-generational and interdependent links between individuals within the occupational socialisation framework in physical education. Consequently pedagogical practice is still based on 'traditional curricula' and teacher directed approach. Pedagogy influences all social interactions within the class, which directly impacts on student engagement or marginalisation. Participants identified interpersonal skills as the most important trait in teaching. PE teachers act as

the recruiters for the profession, therefore students who share their habitus and meet their perceived requirements to become a PE teacher as well as a love of sport and an interest in working with children gain ease of entry into the profession. This enforcement of and 'recycling' of traditional ideologies in PE due to the dominant recruitment process indicates that the subjective warrant still has currency. The subjective warrant no longer permissive and its influencing factors are interrelated.

The effect of environmental temperature during exercise on gut hormones, appetite and energy intake

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A strategy that combines both increasing energy expenditure and reducing energy intake (EI) to induce a negative energy balance is key for preventing and treating obesity. Both acute exercise and hot environmental temperatures have been shown to suppress appetite; thus, exercise in a hot environment may augment the appetite-suppressing effect of exercise. However, the small number of studies that have determined the effect of environmental temperature during exercise on appetite have produced varied results. The aim of this study was to examine the acute effect of exercise in different environmental temperatures on gut hormones and EI. Using a randomised crossover design, 12 healthy males completed four 5.5 hour conditions in a counterbalanced order. A preliminary visit consisting of a sub-maximal and maximal exercise test and anthropometric measures was conducted prior to the experimental conditions. For experimental conditions, participants arrived in a fasted, euhydrated state at 08:30 and were fitted with a cannula, heart rate monitor, rectal and skin thermistors before completing one of four conditions: 60 min treadmill exercise at 70% of maximal oxygen uptake in 10°C, 20°C or 30°C or a 60 min resting control at 20°C. Participants then rested for 4.5 hours in a temperature-controlled environment of 20°C. Blood samples were collected at 0 (fasted), 1, 1.5, 2, 3, 4 and 5 h. Perceptions of appetite were assessed using visual analogue scales at 0, 1, 1.5, 2, 2.5, 3, 3.5, 4, 4.5 and 5 h. *Ad libitum* meals were provided at 1.5 h and 5 h for the quantification of energy intake. Ethical approval has been granted. Data collection commenced in February 2017. Three participants are currently completing the study and the remainder are being recruited, with the aim of completing data collection in July 2017. If exercise in the heat can augment the exercise-induced

reduction in appetite, performing exercise in hotter environments could be an effective and realistic recommendation for the prevention and treatment of obesity.

Associations of sedentary behaviour patterns with cardiometabolic risk in children

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Time spent sedentary increases during adolescence, from 51% of waking hours spent sedentary age 7 years old to 74% age 15 years old (Janssen *et al.*, 2016). Prolonged sitting has been negatively associated with cardiometabolic risk markers in adults (Healy *et al.*, 2008), however, the current literature in children is inconclusive. Many studies use self-reported screen time as a measure of sedentary behaviour and studies that have used activity monitors (accelerometry) have been unable to differentiate postural differences, thus potentially misclassifying sedentary and active behaviours (Janssen *et al.*, 2016). The present study uses an activPAL activity monitor that can differentiate between true sedentary behaviour and physical activity to explore associations between sedentary behaviour patterns and cardiometabolic risk in children. Approximately 150 children aged 11-12 years old will attend a measurement morning and wear an ActivPAL activity monitor for 8 days. Anthropometric and cardiometabolic risk markers, including standing height, body mass and body fat %, body mass index, waist circumference, resting blood pressure, heart rate, lipid profile and blood glucose, will be obtained at the measurement morning and participants will be fitted with an activPAL device. Periods and patterns of sitting (e.g. prolonged sitting, breaks in sitting time), standing, stepping time, and time in different physical activity intensities (light, moderate and vigorous) will be determined using an algorithm developed for use with Stata data analysis and statistical software (Stata, Texas, US). A one-way ANOVA will assess sex differences in all variables. Linear regression will be used to assess associations of cardiometabolic risk marker levels with sitting behaviour variables and physical activity. The level of significance will be accepted at $p \leq 0.05$. Ethical approval has been granted and data collection commenced 28th February 2017. Data sets for cardiometabolic risk markers will be available for 120/146 participants however not activPAL data, hence the application for an oral presentation thesis outline. Data collection will be complete by 16th June 2017. If sedentary behaviour patterns are found to be detrimentally associated

with cardiometabolic risk, this identifies a potential intervention strategy to reduce sedentary behaviour and cardiometabolic risk in children.

Biomechanical feedback to improve balance and stability in an ageing population

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Ageing, a major public health challenge for the 21st century (WHO, 2015), has been associated with fall and fall-related injuries (Tinetti, Speechley & Ginter, 1988; Sturnieks, St George & Lord, 2008). Impairments in sensory, motor and central processing systems lead to balance, mobility and stability disorders (Tinetti, Speechley & Ginter, 1988), which affects negatively older populations' activities of daily living (ADL) (Hirvensalo, Rantanen, & Heikkinen, 2000), health and wellbeing (Frank & Patla, 2003). Consequently, as between 2015 and 2050 this population will double, the demand for health and care services and the future public expenditure will equally increase (WHO, 2007). Therefore, rehabilitation interventions using biomechanical feedback (Giggins, Persson & Caulfield, 2013; Chiarovano *et al.*, 2017) are suggested to improve balance and stability in this population, in order to prevent falls, injuries, reduce future costs and thus improve this population mobility and ADL. Participants will be older adults, aged 65-75 years. Pilot work will conclude on inclusion and exclusion criteria. The project will consist of four studies: 1) Systematic review identifying fundamental variables essential to improve balance and stability in this population; 2) Development of methods of providing biomechanical feedback of the identified fundamental variables; 3) Implementation and evaluation of the intervention and short-term effects analysis; 4) Follow-up assessment to observe if changes were maintained. The project started in March 2017. Currently, the systematic review is being conducted. As a new biomechanical feedback tool to improve balance and stability in ageing populations will be developed and evaluated, this project may bring high impact outcomes to the field of health-related Biomechanics. The project aims to aid older populations' mobility, gait and posture control, which in turn might reduce the risk of fall and injury and enhance the health and wellbeing of this population.

An investigation of the kinetic and kinematic variables related to stability in elite rugby union players

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Rugby union is a fast-paced collision sport which requires a broad range of physical attributes and abilities. Amongst these are the capacity to retain stability when tackled to maintain an attack. Research into tackling is currently focussed on the forces exerted by the tackler and in the scrum, predominantly regarding injury reduction and concussion. No search currently examines the effects of tackle impact on the tackled player, or the neuromuscular strategies employed in stabilising under that impact. This study proposes to investigate what these strategies are, how they are utilised, and whether their development is specific to rugby union athletes. Three groups (elite male (level 2 and higher), sub elite (levels 3-6) rugby union players and experienced weightlifters) will be tested for peak force (PF) and rate of force development (RFD) using a mid-thigh isometric pull on a force plate and complete a Y balance test. EMG readings will be taken at lateral gastrocnemius, vastus lateralis and tibialis anterior to test for muscle latency and centre of pressure deviation (CoP) will be measured. Subjects will then complete an in-development tackle simulation protocol, during which PF, RFD, CoP and EMG data will be recorded whilst running unopposed and at point of contact with an object translating with forces representative of a tackler. Data will be analysed to assess a) whether rugby players are more stable than athletes with similar strength training programmes b) which capacity best relates to increased stability as defined by CoP deviation c) whether differences exist between capacities in dynamic contact vs non-contact and d) performance capacity asymmetries between legs. In development of novel methodology. Understanding kinetic and kinematic processes under external forces has implications for improving performance and reducing lower limb injury in rugby union and other collision sports.

Total sedentary time in South Asian and Caucasian adults: a systematic review

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Higher sitting time increases risk of cardiovascular disease and Type 2 diabetes. South Asians are at higher risk of cardiovascular disease and Type 2 diabetes compared to other ethnic groups in the United Kingdom. Research suggests that physical activity levels are lower in South Asians compared to Caucasians, but it is not clear if sedentary behaviour is more prevalent in this population. This may explain why South Asians are more likely to develop Type 2 diabetes and cardiovascular disease. Therefore, the aim of this systematic review is to investigate total sedentary time in South Asian versus Caucasian adults. A systematic search of literature will be conducted in databases including PubMed, Web of Science, and Discover using the following Boolean operators:- "sitting" OR "sedentary*" OR "television" AND "South Asian*" OR "Bangladesh*" OR "Indian*" OR "Pakistan*" OR "Sri Lanka*" OR "Nepal*" OR "Caucasian*" OR "white". Inclusion criteria will be peer reviewed published articles between 1990 and 2017, published in English, studies of South Asian or Caucasian adults, observational study designs, and measured total sedentary time. All articles will be reviewed independently by two reviewers using the following stages: (a) screening of titles, (b) screening of abstracts, and (c) screening of full text articles. The following data from the accepted articles will be extracted: sample size and characteristics; data collection methods; study outcomes (overall sedentary or sitting time per day). Appropriate quality assessments tools will be used for assessing quality and bias for each study. The literature search is completed for this systematic review study. The search result identified a total of 4,156 articles (398 from PubMed, 2,742 from Web of Science, and 1016 from Discover). A total of 2,672 articles remained after removing all duplicates. The first stage of screening (based on title only) is almost complete. All screening will be completed by June 2017 with data extraction to take place in July. The findings of this systematic review will identify total sedentary time in South Asians and Caucasians. If higher sedentary time occurs in South Asians, this could explain their higher risk of Type 2 diabetes and cardiovascular disease and help identify a preventative strategy targeting reduction in sedentary behaviour in this population.

The feasibility of MyHealthAvatar mobile phone application for reducing prolonged sedentary behaviour and improving glucose control in Type 2 diabetes

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The increasing prevalence of Type 2 diabetes mellitus, (T2DM) justifies the need for cost-effective, self-management treatment strategies to be identified. Sedentary behaviour is associated with an increased risk of cardiovascular disease and premature mortality in T2DM. Technology is readily available and widely used in the modern society and has thus been identified as a potentially effective method to aid self-management of T2DM. The present study will assess the feasibility of the mobile phone application, MyHealthAvatar, for reducing prolonged sedentary behaviour and improving glucose control in people with T2DM. It will further investigate the psychological determinants of behaviour and influence on mood. Twenty male and female individuals aged 18-65 years with self-reported diagnosed early stage T2DM will be randomly allocated to either a control or intervention group for 8 weeks. Cardiometabolic risk markers (body mass index, body fat %, waist circumference, blood pressure, oral glucose tolerance) and psychological variables (attitude, social norms, perceived behavioural control, mood) will be measured at baseline and post-intervention, alongside sedentary behaviour for seven days using an activity monitor. Qualitative and quantitative data analysis will be used to evaluate the effect of intervention condition on the outcomes. Semi-structured interviews and thematic analysis will provide process evaluation on the experience of using the app and recommendations for improvements. Ethical approval has been obtained from the South Cambridge NHS Research Ethics Committee and participant recruitment is underway via advertisement of the study using posters and leaflets, Diabetes UK support groups and local GP surgeries. Should data suggest that the app is an acceptable and feasible intervention to reduce prolonged sedentary behaviour and improve glucose control in T2DM, a full-scale randomised controlled trial will be conducted.

Development and evaluation of a workplace intervention to reduce prolonged sedentary behaviour

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Sedentary behaviour is a common occurrence in the workplace, particularly in office environments. Sedentary behaviour is adversely related with obesity, insulin resistance, Type 2 diabetes, cardiovascular disease and premature mortality (World Health Organisation, 2010). Experimental studies have shown promise that interruptions to prolonged sitting can

improve cardiometabolic risk markers (Peddie *et al.*, 2013; Bailey *et al.*, 2016). Therefore, it is of importance that interventions to reduce prolonged sedentary behaviour are developed and tested for feasibility and efficacy in the workplace environment. A multicomponent intervention will be developed incorporating environmental, educational/behavioural, and physical activity changes within the workplace. Identifying the behaviour change techniques and/or theoretical frameworks that promote positive cardiometabolic changes is the first step, and this will be achieved via a systematic review of the literature. Once these components/frameworks have been identified, a feasibility trial will be conducted to develop an intervention for a full-scale randomised controlled trial (RCT). Finally, an RCT will be conducted to evaluate the sedentary behaviour intervention effects on cardiometabolic risk marker levels in office workers. Intervention elements may include the use of sit-stand desks, wearable technology, and motivational coaching to reduce prolonged sitting. A systematic review is currently underway to determine the most efficacious sedentary behaviour intervention techniques for improving cardiometabolic risk markers. Findings will inform the next stage feasibility intervention. Development of a workplace intervention using the processes described above could potentially lead to an effective sedentary behaviour reduction intervention that improves cardiometabolic risk in office workers and could have implications for workplace design and the occupational management of cardiometabolic disease risk.

Leading by example: leading a PE department into models based practice from traditional PE delivery

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Models-based practice (MBP) has long been heralded as the successful future of physical education (PE) and yet it is still considered an innovation despite decades of research (Kirk, 2009; Goodyear and Casey, 2015). MBP faces much resistance in schools which Kirk suggests is a result of occupational socialisation to the PE-as-sport-techniques model which dominates British schools. These PE curricula follow a structure of short multi-activity units that have been seen as damaging for many groups (Kirk, 2009). There is a need for research to bridge the gap between theory and practice by demonstrating 'how' this works rather than just 'does' it work (Casey, 2014). The aim of the project is to track, reflect on and shape one teacher-researcher's journey

using a pedagogical model as part of moving a department towards teaching an entirely models-based PE curriculum. This project's design focuses on action research by teachers, with elements of critical appreciation. The setting is the teacher-researcher's PE department in a co-educational secondary school in the East of England. Action research involves a four-stage cyclical process whereby practitioners Reflect - Plan - Act - Observe in order to understand and develop their practice (Gubacs-Collins, 2007). Supporters of MBP for PE advocate action research because this design encourages sustainable change built on reflection by those actors invested in the practice, rather than short interventions by outsider (Casey, Dyson and Campbell, 2009). One pedagogical model, Sport Education (Siedentop, 1994), has previously been introduced to the PE curriculum for all teachers in the department. The teachers in this department have become used to using this model although this is different from widely used traditional PE teaching strategies. Methods of data collection include recording structured staff planning meetings, reflective journal by the researcher and post-lesson reflective surveys by teachers. In action research, analysis occurs concurrently with data collection in order to support reflection on what has occurred and hence planning of the next stage. Initially this project seeks to provide some insight for leaders of PE on the rewards and challenges of MBP as a curriculum framework by exploring the ways in which pedagogical change happens in context. The aim is to show peers and fellow teaching professionals that although this is a complex journey, it is achievable and worthwhile. Additionally but equally important, is that through action research the whole department are involved in a process that allows them to improve in their use of MBP.

Poster Presentations

Rachael Champion

Interrupting prolonged sitting with treadmill desk walking reduces postprandial glucose concentrations in sedentary adults

Lauren Corke

What Instagram shows, women follow: living in the age of digital sociology

Stacey Essam

How effective is a models based practice approach on increasing girls participation within Physical Education?

Chloe Grieves

Restrictive or facilitating creativity? Teachers perceptions on pedagogical models benchmarks

Jade Horsley

A study into the stereotypical assumptions surrounding women's football and the potential effects on participation levels

Lauren Howard

The influence of previous lower limb injury on muscle activation and lower limb kinematics in mountain bike cyclists

Peter McDonald

The effect of tyrosine and caffeine supplementation on simulated soccer performance at 18°C

Declan McGuire

The effect of athletic footwear on muscle reaction time to a simulated lateral ankle sprain mechanism

Zoe Mullally

The future of Physical Education: teachers', trainee teachers' and students' perceptions

Emily Rath

How do gender stereotypes and social norms affect the participation of primary school children within Physical Education and sport?

Tom Timotheou

Centre of pressure distribution during sit-to-stand tasks in adults with Down Syndrome



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