Standing Preschools Project

Short-term effects of a “reduced-sitting pre-school day” on energy expenditure, musculoskeletal health, and cognitive development in pre-schoolers: a whole room calorimeter study.

Information Sheet for Parents

Dear Parent,

Full details about the project, its purpose, the researchers involved and what is required of your child, should you agree for your child to be involved, are provided in this information sheet.

What is the purpose of this study?
The aim of this study is to assess the acute effects of a “reduced-sitting pre-school day” on energy expenditure, musculoskeletal health, and cognitive development in preschoolers’, using the whole room calorimeter. The calorimeter is a room around the size of a child’s bedroom, which measures the oxygen consumption and carbon dioxide production of the person inside. From these measurements we are able to accurately measure energy expenditure.

Currently, very little is known about the time young children spend sitting whilst at childcare and the patterns of their sitting. However, what is known is that long periods of sitting maybe harmful for the health, growth and development of young children. Given the potential harmful effects of prolonged periods of sitting and the fact that around 80% of all young Australians spend some time in formal childcare each week, it is important to understand how much more energy is expended if a child sits for less total time during a typical pre-school day.

We are asking for your assistance in furthering our research in this area, by allowing your child to participate in this study.

Your child must be 4 or 5 years old to participate in this study. If your child is currently 3, but turning 4 before data collection begins (February – August 2015) then you may register your child to participate while they are still 3.

Significance and Innovation
This study plans to address the high levels of sitting found among pre-schoolers during their time at childcare, which has the potential to substantially improve the health and developmental outcomes of the children. Our research team is currently working with pre-school staff to identify ways to modify the pre-school environment and policies to reduce by half the amount of time spent sedentary (sitting) during a pre-school day. This study is being funded by an Illawarra Health and Medical Research Institute Small Grant.

What we are asking your child to do?
We are asking your child to visit the Calorimeter room at the University of Wollongong on three occasions. During the first visit they will become familiar with the calorimeter room and
complete some initial measurements. On the remaining two visits the child will participate in a half day mock childcare routine where they will be observed and their energy expenditure will be measured. The child will be asked to wear some physical activity monitors during their time in the Calorimeter room. Further details of these monitors are outlined below in the details of the visits. During their time inside the Calorimeter room the child will be in the room on their own, but still in constant visual and verbal contact with their parent/guardian and the qualified childhood educator and research students. They will stay inside the room for approximately 2 to 2.5 hours, the equivalent of half a day in childcare.

Your child’s height and weight will be measured and musculoskeletal and executive function assessments will be conducted prior to entering and immediately upon leaving the calorimeter room. The Executive Function assessments consist of two iPad games and a card sorting task to measure inhibition, working memory and shifting. The Child will be asked to wear two small lightweight monitors after visits two and three, for 48 hours after each visit. The Parent/Guardian of the child participating will be asked to complete a Monitor Log that tracks when the child is wearing these monitors.

**Details of Visits:**
Visit 1 – Initial familiarisation with calorimeter room and a discussion with parents and children to start the process of consent. After giving consent, musculoskeletal, height and weight and posture analysis assessments will be conducted. The child will take home an information book which parents will read to them several times to familiarise them both with the study.

Visit 2 – (typical pre-school day-50% of time sitting). Participants will arrive at around 8.00am after having eaten at IHMRI where they will receive a standardised breakfast. Executive function assessments will be conducted prior to entering and musculoskeletal and executive function assessments immediately upon leaving the calorimeter. A standard morning tea will be consumed around 1.5 hrs after entering the calorimeter and lunch will be provided at the completion of the protocol (after 3 hrs in the calorimeter). Participants will spend 50% of their time in the calorimeter sitting, undertaking tasks that they normally would as part of a typical day at pre-school. The parent will be able to view the child in the Calorimeter at all times if desired. The child will be constantly supervised and in contact with a trained qualified Childcare educator, and a research student from the University of Wollongong.

Visit 3 – (modified pre-school day-25% of time sitting). This will be identical to Visit 2 except that participants will sit for 50% less time and replace this with 50% more time spent in light-intensity activity (such as standing) based on the modifications suggested by child care staff and tested by our pediatric physiotherapists. Musculoskeletal, height and weight, and executive function assessments will be conducted prior to entering and immediately upon leaving the calorimeter. The parent will be able to view the child in the Calorimeter at all times if desired. The child will be constantly supervised and in contact with a trained qualified Childcare educator, and a research student from the University of Wollongong.

Before entering the calorimeter on Visits 2 and 3, your child will be fitted with an Actigraph accelerometer on each wrist and both hips, a Sensewear device around their upper arm and a GENEActiv (accelerometer) on each wrist and both hips. Your child will also be asked to wear a small lightweight activity monitor (called an activPAL). The activPal activity monitor is worn on the upper thigh being attached to the child’s thigh using a dual layer of Hydro Gel (which is similar to a bandaid) as recommended by the manufacturer. This activity monitor allows us to measure the amount of time sitting as well as different postures.

Your child will also be fitted with one small device that will be used to assess their posture, using video footage of their time in the room. This will be a belt around their waist.
EEG headset
Please note: This is an optional component of the study
Your child will be fitted with an electroencephalography (EEG) measurement headband. This will measure brain electrical activity from one location on the forehead. This measurement will occur whilst completing the following tasks:

1. Eyes open – the participant sits with their eyes open, looking straight ahead at an object, for 3 minutes.
2. Eyes closed – the participant sits with their eyes closed for 3 minutes.
3. Executive function tests after visit 2 and 3

From these measurements we will determine if there are any differences in EEG data when completing the Executive Function tests after a ‘typical day’ and a ‘modified day’.
If any history of head injuries, epilepsy, periods of unconsciousness, etc is reported by parent, the child will be excluded to wear the EEG headset.

You are able to choose if you want your child to participate in this component of the study.

Participants will be free to leave the calorimeter at any time, or remove the Physical Activity Monitors if they cause any distress. All measurements will be in the presence of a research assistant (an early childhood trained educator who can observe and communicate with the participant at all times via an external window and intercom).

Visits 2 and 3 will be randomly allocated to each child so there is a chance your child could do visit 3 prior to visit 2. These visits will last 4 hours, this includes the assessments before and after entering the calorimeter room.

As there is a possibility that children may compensate for sitting less and engaging in more light-intensity PA by being less active afterwards, we will ask them to wear an Actigraph and a Sensewear mini arm band whilst in the calorimeter, and for 48 hours afterwards. The Sensewear Mini combines accelerometry with four additional physiological sensors (heat flux sensor, galvanic skin response, skin temperature, and a near-body ambient temperature) and will be used to assess energy expenditure over the 48 hour period immediately following Visits 2 and 3. To measure if participants compensate for less sitting by increasing their energy intake, a lunch will be provided after the participant left the calorimeter room.

You will be asked to fill in a one-page accelerometer log that provides information about when the monitor was worn or not worn (eg removed for bathing) during the 48-hour period immediately following Visits 2 and 3. An information sheet about these monitors will be provided.

Your child will be recorded on video while performing the activities in the calorimeter. The video recording helps us to analyze their posture while standing. No one else other than the researchers involved in this study will have access to the video recording and it will be stored securely in a locked office.

What are the benefits and risks involved in this study?
This study plans to address the high levels of sitting found among pre-schoolers during their time at childcare, which has the potential to substantially improve the health and developmental outcomes of the children.
There are minimal risks associated with this study. Your child will be supervised by the researchers at all times. Your child can alert the researcher by pressing a button. In addition, the intercom will be left on at all times so that your child can be heard outside the calorimeter at all times. Your child will be able to see the educator and research assistant at all times and will be able to exit the calorimeter if they wish.
As we will be providing your child with a healthy snack and lunch while they are in the Calorimeter room we ask you to provide any food or contact allergy information for your child on the consent form. This also includes any allergy to wheat and Play-Doh that your child will be playing with.

Some of the Executive Function assessments will use coloured cards to test the child. If your child is colour blind please indicate this on the consent form.

EEG measurement recording is 100% safe and pain-free. EEG recording is a non-invasive and safe way to view and record brain electrical activity. It involves fitting an EEG measurement headband, a procedure that takes 10-30 seconds. Note that this form of EEG measurement allows identification of abnormal brain functioning at an individual level, and parents will be informed of this if identified by the research, and confirmed by research psychologist, Associate Professor Stuart Johnstone. Parents will be given the opportunity to have their child referred to their general practitioner for ongoing assessment and management.

**Participation in the study**
You and your child are free to discontinue participation at any time. Discontinuation of your or your child’s involvement will not jeopardise your or your child’s current or future relationship with your early childhood service or with the University of Wollongong.

**What will happen to the information that you provide?**
All information collected during this study will be kept strictly confidential and be stored in a locked office. Data from the activity monitors maybe used in publications such as papers, conference presentations and grant applications, however your identity, your child’s identity and that of your early childcare service will be kept strictly confidential.

**Who is conducting the study?**
- Professor Tony Okely, School of Education, University of Wollongong.
- Professor Stewart Trost, School of Human Movement Studies, University of Queensland
- Associate Professor Stuart Johnstone, School of Psychology, University of Wollongong
- Dr Diane Harland, School of Health Sciences, University of Wollongong
- Lyndel Hewitt, Paediatric Physiotherapist, Wollongong Hospital
- Samantha Stevens, Paediatric Physiotherapist, Wollongong Hospital
- Joanne Morrell, Paediatric Physiotherapist, Wollongong Hospital
- Dr. Steven Howard, School of Education, University of Wollongong.
- Ms Yvonne Ellis, PHD Student, School of Education, University of Wollongong.
- Mrs Tamara Raso, School of Education, University of Wollongong.
- Mrs Melinda Smith, School of Education, University of Wollongong.

If you are happy for your child to participate in this study, please send an email to yge019@uowmail.edu.au or phone 4221 5486.

Kind Regards,

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If you have any questions regarding the study, please contact Yvonne Ellis on (02) 4221 5486. If you have any concerns or complaints regarding the way the research is or has been conducted, you can contact the Complaints Officer, Human Research Ethics Committee, University of Wollongong on (02) 4221 4457 or by email (rso-ethics@uow.edu.au).

Your co-operation in this project will be greatly appreciated.