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Overview

The Institute for Health and Rehabilitation Research was formally established in 2008, and became a reality in March 2009 with the appointment of the Director, Professor Beth Hands. The staff of the Institute also includes Professor Max Bulsara (Biostatistician) and Louisa Smith (Senior Administration Officer). The Institute’s purpose is to promote learning, scholarship, research and professional development in health and rehabilitation by drawing together scholars with different but complementary professional and disciplinary backgrounds. To this end, we continue to meet with, and involve fellow academics from the Schools of Medicine, Education, Nursing, Health Sciences and Arts and Science in potential research projects. The IHRR partners with the General Practice and Primary Health Care Research Unit in the School of Medicine to deliver a seminar series for staff and maintains regular contact with the other UNDA Research Centres on Broome (Nulongu) and Sydney campuses (Centre for Faith, Ethics and Society).

UNDA based Research Projects

1. AMPitup – Adolescent Movement Program (Hands, McIntyre)

The Adolescent Movement Program is designed for adolescents (12 – 18 years of age) with movement difficulties and commenced in February 2010 with 13 participants. It now has a maximum cohort of 20 participants. To participate in the program, the applicant is screened using the McCarron Assessment of Neuromuscular Development (McCarron, 1997). They need to receive a Neuromuscular Development Index of 85 or less (Mean = 100, SD = 15), and have a history of movement avoidance. While there are some participants with just a motor learning disability (or Developmental Coordination Disorder), others have co-occurring conditions such as cerebral palsy, autism, vision impairment, Autism Spectrum Disorder (including Asperger Syndrome), or Down Syndrome.
AMPitup Research Projects
Improving Fitness and Motor Skills in Adolescents with DCD

A primary research question underpinning the program relates to the challenge of measuring fitness in individuals with poor coordination. A true measure of fitness is difficult given many fitness tests require a high a degree of coordination. Similarly a true measure of motor competence is difficult as many measures require a high degree of physical fitness. Measurement is also affected by earlier fatigue experienced by this group due to reduced movement efficiency and consequent higher energy demands.

Research Questions

1. To what extent do results for clinical and field-based tests of physical fitness (cardiorespiratory endurance, muscle strength and endurance, flexibility) differ between adolescents with and without motor learning difficulties?

2. To what extent do the results for different clinical and field-based tests of health related physical fitness (cardiorespiratory endurance, muscle strength and endurance, flexibility) change for adolescents with motor learning difficulties as a result of participating in a 13 week exercise program?

The Association between Fitness, Motor Skill and Self Perceptions in Adolescents with Motor Learning Difficulties.

The sense of mastery of physical control is closely related to physical abilities and crucial to the development of a healthy self-concept. From this perspective, the perception of physical competence has implications for the overall value an individual places on itself. In this study we are interested in exploring how adolescents with high and low motor competence differ in perceptions of competence as well as the impact of level of actual motor competence and perceived motor competence on global self-worth. Given that perceptions of competence are largely based on the perceived success of movement mastery, it could be expected that perceptions of physical competence of adolescents with low motor competence to be low.

Research Question

1. Do improvements in physical fitness affect the self perceptions of adolescents with low motor competence?

Motor Competence and Bullying in Adolescence

Adolescents with low motor competence are vulnerable to bullying particularly because sporting ability and prowess is highly valued by Australian children. This study examines the prevalence and type of bullying between adolescents with low and high motor competence. The coping strategies used by adolescents to deal with bullying will be explored.
The Effect of Exercise on Bone Mineral Density in Adolescents with Low Motor Competence

Low bone mineral density (BMD) elevates the risk of fractures and osteoporosis. Bone mass is higher in children who are physically active particularly those who participate in high intensity and high impact activities such as gymnastics, ballet and strength training. Peak bone mineral accrual rate occurs around puberty and weight bearing exercise programs involving adolescents have shown significant increases in BMD. However, adolescents with low motor competence (sometimes referred to as Developmental Coordination Disorder) are less physically active than their peers and therefore at risk of reduced bone strength and the associated health issues.

The specific aims of this project are:

1. To determine if bone mineral density (BMD) differs between adolescents with and without low motor competence (LMC). As adolescents with low motor competence are less likely to participate in high-intensity weight-bearing physical activity we hypothesise that bone strength will be lower in those with LMC compared to those with normal to high motor competence (HMC).

2. To assess if BMD changes in children with LMC after participating in a 12 week strength and resistance training program. We hypothesise that measurable changes in bone strength will be observed in the group with LMC who participate in the exercise program compared to group with LMC who do not participate and the HMC group.

3. To compare dual energy X-ray absorptiometry (DXA) and peripheral quantitative computer tomography (pQCT). Measurements of BMD are possible using both methods. We hypothesise that pQCT offers the advantage of three dimensional/geometry-based peripheral analysis with more accurate BMD values, assessment of fracture risk, exposure to less radiation, shorter duration and easy accessibility.

This program now involves one Honours and one Masters student.

2. A Group Exercise and Counselling Program to improve Quality of Life for Breast and Prostate Cancer Survivors. (Martin, Naumann, Philpott, Parker, Piggott, Hands, Bulsara, M., Bulsara, C., Arnold-Reed, Brett, Woolfitt, 2011-2012)

The immediate and lasting symptoms observed in patients diagnosed with cancer have gained attention in the oncology arena, especially as survival rates have improved. Unfortunately, survival is also often associated with compromised quality of life and lingering side effects that may
persist for many years. These side-effects include debilitative fatigue, sleeping problems, pain, loss of strength, increased subcutaneous fat and weight gain, lymphodema, disrupted sexual function, disturbances in body image and self-concept, anxiety, depression and the development of co-morbidities. Treatment success may be improved if patients are able to develop physical and psychological strength to deal with its debilitating side effects. Thus, it is crucial that an integrated approach towards managing the physiological and psychological needs of clients with cancer be developed, that involves strategies to reduce the symptoms and enhance recovery and quality of life. This program aims to evaluate the effects of combining two powerful modalities, exercise and counselling, on the quality of life for breast and prostate cancer survivors. Participants are men and women who have completed their treatments for prostate or breast cancer within the last 5 years.

External Research Projects

The Western Australian Pregnancy Cohort (Raine) study (Hands, Parker, Rose, Larkin)

The Raine study was started from a pregnancy cohort. 2,900 women were enrolled in a controlled trial at or before the 18th week of gestation. Behavioural and physiological data have been collected from the cohort at 1, 2, 3, 5, 8, 10, 14, 17 and now at 20 years of age. Our team has custodianship of the physical activity, physical fitness and motor competence data. This involvement has resulted in Hands being an investigator on several large grants, two PhD projects and numerous publications.

TARGIT – Breast Cancer RCT (Baum, Joseph, Tobias, Wenz, Keshtgar, Alvarado, Bulsara, Eiermann, Williams & Vaidya, on behalf of the TARGIT Trialists' Group)

The main aim of the trial is to evaluate whether a single fraction of radiotherapy given intra-operatively and targeted to the tissues at the highest risk of local recurrence (partial breast irradiation) is equivalent to 5-7 weeks of standard post-operative radiotherapy after breast conserving surgery in women with early breast cancer, in terms of risk of local cancer recurrence.

The trial also aims to compare the treatment arms with respect to site of relapse within the breast, relapse-free and overall survival, cosmetic outcome, local toxicity and quality of life. Sub-studies for patient preferences and satisfaction will also be assessed, likewise health economics issues such as the cost-benefit of the different treatment modalities, and also a translational study.
**TREK** (Giles-Corti, van Niel, Timperio, **Bulsara**, Pikora & McCormack)

This project aims to examine the extent to which the urban design of local neighbourhoods hinders or facilitates the active transport (AT) patterns of Year 5 to 7 children attending Perth metropolitan public primary schools, particularly AT to school and specifically to:

- To use Geographic Information Systems (GIS) to develop a child-specific ‘walkability’ index and to examine walkability within 2 km of all Perth public primary schools;
- To identify the 12 most ‘walkable’ and 12 least ‘walkable’ public primary schools;
- To identify individual, social-environmental, school policy and urban design factors associated with AT patterns to school in children attending the most and least walkable schools;
- To examine the relative influence of parental and student perceptions of safety, social environmental factors (e.g., peer influences), and objective measures of safety on AT trips;
- To compare objective GIS measures of the environment and parental and student perceptions of the environment en route to school.

**Type 1 Diabetes Mellitus** (Jones, Davies, Siafarikas & **Bulsara**)

We are involved with a team of researchers interested in exploring a number of different issues surrounding Type 1 Diabetes mellitus. Topics include:

- Determinants of Late Onset Post-Exercise Hypoglycaemia
- Oral insulin for prevention of diabetes in relatives at risk for type 1 diabetes mellitus
- Adolescent Type 1 Diabetes Cardio-Renal Intervention Trial (AdDIT)
- Fremantle Diabetes Study Phase II: A community-based study of diabetes care, control, complications and cost.
- Impact of Exercise on Macrovascular and Microvascular function and Insulin sensitivity in young people with type 2 diabetes.
- The long-term impact of severe hypoglycaemia on the brain of the young patient with diabetes - a follow-up study.
- Improving access to retinopathy screening and determining the prevalence of diabetic retinopathy in adolescents with type 1 and 2 diabetes
- RCT of the intragastric balloon and lifestyle intervention versus lifestyle intervention alone in obese adolescents.
- Impact of exercise on macro and microvascular function and insulin sensitivity in young people with type 2 diabetes.
- The use of continuous subcutaneous insulin infusion with real-time continuous glucose monitoring system and low glucose suspend feature (CSII + RT-CGMS + LGS) versus continuous subcutaneous insulin infusion with real-time continuous glucose monitoring system (CSII + RT-CGMS) versus continuous subcutaneous insulin infusion only (CSII) in patients with type 1 diabetes (T1D) with impaired awareness of hypoglycaemia – a randomised controlled trial.
**Other Small Research Project Involvement**

Impact of being born small for gestational age on glucose and lipid metabolism in adults (Siafarikas, **Bulsara**, Mohnike & Jones).

Analysis of current practice of vitamin D supplementation in Germany and possible benefits from sun exposure (Siafarikas, **Bulsara** & Hesse).

Importance and of parathyroid hormone related peptide (PTHrP) for perinatal calcium regulation (Siafarikas, **Bulsara**, Hesse & Jones).

Vitamin D deficiency in WA: Role of sun exposure and supplementation (Siafarikas, **Bulsara**, Jones, Burgner, Cherian & Simmer).

Hypoglycaemia counter regulation in adolescents – impact of initiation of insulin pump therapy from diagnosis (Siafarikas, **Bulsara**, Davis & Jones).

Effect of exercise on insulin sensitivity in obese adolescents (Siafarikas, **Bulsara**, Davis, Jones, Green & Watts).

**Current Research Grants**

2. **2011-2013 NHMRC APP1008394** Moorin, R., Holman, D., **Bulsara**, M. & Fox, R. Policy translation of an Australian evaluation of computed tomography (CT) scanning. $386,299
4. **2010-2014 Department of Health and Aging – Palliative Care Program** Emery, J., Holman, C., Saunders, S., Walter, F., Moorin, R., Auret, K., Preen, D. & **Bulsara**, M. Partnership Intervention Trial to Redress Treatment Delay and Improve Outcomes in Rural Cancer Patients. $150,000
5. **2010 Program Development Grant** Martin, E., Naumann, F., Philpott, M., Parker, H., Piggott, B., **Hands**, B., **Bulsara**, M., Bulsara, C., Arnold-Reed, D., Brett, T. & Woolfitt, C. Cancer Survivor Program. A joint initiative between The University of Notre Dame, Fremantle Campus, The Fremantle GP Network and HBF. $79,000
7. 2009 NHMRC 572765 Holman, C., Emery, J., Saunders, C., Walter, F., Moorin, R., Auret, K., Preen, D. & Bulsara, M. Partnership Project Grant: A Partnership Intervention Trial to Redress Treatment Delay and Improve Outcomes in Rural Cancer Patients. $1,215,262

8. 2009 NHMRC 634308 Davis, E., Sherrington, C. & Jones, T. RCT of the intragastric balloon and lifestyle intervention versus lifestyle intervention alone in obese adolescents. $573,700 (Bulsara – Al)

9. 2009 Cancer Council Western Australia Einarsdottir, K., Haggar, F., Bulsara, M., Preen, D. & Holman, D. Cancer in the Adolescent and Young Adult Population: Incidence, Survival and Patterns of Care in Western Australia from 1981-2007. $24,860


Grants under Consideration 2011


4. 2011 NHMRC - APP1025149 Carter, K., Bulsara, M., Francis, R., Ball, S. & Franklin, P. Developing risk models for predicting childhood asthma using linked health data


Unsuccessful Grants in 2010

1. McIntyre, **Hands & Bulsara.** The Financial Markets Foundation for Children. The validity of a Fundamental Movement Skill Quotient as a measure of motor competence among 6- to 7-year-old Australian children $33,000.

2. **Hands**, Siafarikas, McIntyre The Financial Markets Foundation for Children The effect of exercise on bone mineral density in adolescents with low motor competence $61,000

3. **Hands**, Piek, Rose, & Rigola Australian Rotary Health Developmental Coordination Disorder: A risk factor for mental illness in adolescents $63,015

4. **Hands** & McIntyre Commonwealth Bank Grant AMPitup: An exercise program for adolescents with movement difficulties $10,000

5. **Hands** & McIntyre Perpetual Philanthropic Services. AMPitup; Movement program for Adolescents $33,600.

6. NHMRC - APP1004073 Zhang, M., Holman, C. & **Bulsara, M.** Green Tea and Dietary Intake and Breast Cancer Survival: A Prospective Cohort Study among Women with Breast Cancer $124,152

7. NHMRC - APP1009260 Carter, K., **Bulsara, M.**, Francis, R., Ball, S. & Musk, A. Using linked health data and advanced bioinformatics and spatiotemporal techniques to investigate critical factors contributing to childhood asthma in Western Australia $258,029


Papers Published / In Press


Atkins, E., **Bulsara, M.** & Panegyres, P. Cerebrovascular risk factors in early-onset dementia. *Journal of Neurology, Neurosurgery & Psychiatry* (accepted for publication 25/05/2010)


Davis, W., Brown, S., Jacobs, I., Bulsara, M., Beilby, J., Bruce, D. & Davis, T. Angiotensin-converting enzyme insertion/deletion polymorphism and severe hypoglycaemia complicating type 2 diabetes: The Fremantle Diabetes Study. *The Journal of Clinical Endocrinology & Metabolism (accepted for publication: 29/12/10)*


Mak, D., **Bulsara, M.**, Goggin, L. & Effler, P. Resending a consent form and information package to non-responders increases school-based vaccination consent return rate. *Australian & New Zealand Journal of Public Health* (accepted for publication: 3/12/2010)

Park, J., Slack-Smith, L., Smith, A., Frydrych, A., O’Ferrall, I. & **Bulsara, M.** Knowledge and perceptions regarding oral and pharyngeal carcinoma among adult dental patients. *Australian Dental Journal* (accepted for publication: 14/12/2010)


**Conference Presentations**

Chivers, P., **Hands, B**, Parker, H. & **Bulsara, M**. (2010). The influence of individual, behavioural and environmental factors on BMI at 6, 8, 10 and 14 years. *Obesity Research and Clinical Practice*, 4S, S41. Australian and New Zealand Obesity Society Annual Scientific meeting, Sydney, 21-23 October.


Chivers, P., **Hands, B**, Parker, H. & **Bulsara, M**. (2010). The contribution of individual, behavioural and environmental factors during childhood to adolescent weight status. PHCREd Annual Research Conference, Perth, WA 12th Nov


**Students**

**Honours (UNDA)**

R Brazel  
*Emergency Department chest pain classification, investigation and 12 month outcome.* (Playford and Bulsara)

C Smith  
*The association between physical activity, sedentary behavior, aerobic fitness and NAFLD in adolescents* (Adams and Hands)

G Trotter  
*Factors which increase parental concern about their child's weight* (Gibson and Bulsara)
**Master of Education (UNDA)**

M Doolan  
*Development and trial of a report card on children’s physical activity in Western Australia.*  *(Hands)*

**PhD (UNDA)**

T Grace  
*Predictors of motor competence from birth to 17 years: A longitudinal study.*  *(Hands and Bulsara)* (2010 onwards)

A Williams  
*Social networking sites: friend or foe?*  *(Hands and Farringdon)* (2010 onwards)

A Das  
*Using video analysis to develop practical nursing skills.*  *(Hands and Alliex)* (2010 onwards)

**Prof Doc (UNDA)**

G Ross-Adjie  
*The effect of an evidence-based bowel protocol on time taken to return to normal bowel function in post-operative major joint replacement patients.*  *(Monterosso and Bulsara)*

**PhD (UWA)**

K Mackie  
*Validation of Musculoskeletal Tissue Banking in Australia.*  *(Zheng and Bulsara)*

K Villanueva  
*Children’s independent mobility in the neighbourhood.*  *(Giles-Corti and Bulsara)*

G Woods  
*Driving up obesity? Exploring the relationship between travel mode to school and weight status in children.*  *(Giles-Corti, Christian and Bulsara)*

**PhD (Curtin)**

P Wyndow  
*Longitudinal determinants of political change: investment and equity in population health and education.*  *(Jianghong, Mattes and Bulsara)*

**Other Activities**

**Staff Research Seminars**

**April** – Harmsen, J.  Finding Evidenced-Based Information  
**June** - Bulsara, C. Mixed or Multiple Research Methods  
**September** – Clarke, H. Finding funds for Research in Health Sciences  
**September** – Walley, C. Understanding Diversity & Cultural Awareness in Tertiary Settings

**Annual Research Seminar 3rd November**

An all day forum highlighting staff research presentations from the Schools of Medicine, Health Sciences, Physiotherapy, Education, Arts and Science and Nursing.
Committee Membership

Beth Hands
University Research Committee
Human Research Ethics Committee

Max Bulsara
School Research Committee Medicine
UWA, Centre for Health Services Research Committee
Advisory Group member of Cancer and Palliative Care Research and Evaluation Unit
Member of TARGIT DMC and ISC
Member of the Editorial Board of BMC Public Health Journal
Member of the Editorial Board of BMC Medical Research Methodology Journal
Member of the Editorial Board of BMC Proceedings Journal
Statistical Editor for Cochrane Acute Respiratory Infections Group

Staff

Prof. Beth Hands, Prof. Max Bulsara and Louisa Smith

Director - Professor Beth Hands, BEd,BSocWk, GradDipEdStudies, Med, PhD
Chair in Biostatistics – Professor Max Bulsara, BSc(hons), MSc, PhD(Dist)
Senior Administration Officer – Louisa Smith
Adjunct Appointments

- Dr Aris Siafarikas, MBBS, PHD, ESPE, APE, DGE, FRACP
  Clinical Assoc Prof, (PMH)

- Dr Caroline Bulsara, BA(Hons), PhD
  UWA

- Dr Elizabeth Rose PhD, MPE, MEd.,BEd (Hons)
  UNDA

- Dr Fiona Naumann –PhD, BAppSci., DipEd
  Uni NSW

- Dr Timothy William Jones, MBBS, MD, DCH, FRACP
  Clinical Professor, PMH