

College of Kinesiology

Research Showcase

Leading and inspiring movement, health & performance
March 29 - April 1



UNIVERSITY OF SASKATCHEWAN
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Book of Abstracts 2021

College of Kinesiology Research Showcase

2021 Overview

MARCH 29th: 1:30 – 4:00 PM CST

- Opening by Dr. Jon Farthing, Associate Dean Research & Graduate Studies
- Undergraduate honours student presentations

MARCH 30th: 11:30 AM – 1:00 PM CST

- Introduction by Justin Pifko, CKGS Representative
- Post-doctoral fellow presentations
- Faculty presentations

MARCH 31st: 1:30 – 3:30 PM CST

- Introduction by Dr. Jon Farthing, Associate Dean Research & Graduate Studies
- Undergraduate honours student presentations

APRIL 1st: 2:00 – 4:00 PM CST

- Introduction by Justin Pifko, CKGS Representative
- Graduate student presentations

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Honours Student Presentation Schedule

MONDAY MARCH 29TH – 1:30 – 4:00 PM CST

1:30	Opening remarks by Dr. Farthing	Supervised by:
1:45	Horace Lam	Dr. Joel Lanovaz
2:00	Kalie Schemenauer	Bart Arnold
2:15	Jasmine Petit	Dr. Alison Oates
2:30	Alexa Koupantsis	Dr. Alison Oates
2:45	Saiyuga Suthaakarann	Dr. Corey Tomczak
3:00	Fatima Ali	Dr. Louise Humbert

Investigating the reliability of the Xsens inertial motion capture system for dynamic balance measures

Student: Horace Lam

Research Theme: Human Performance

Supervisor: Dr. Joel Lanovaz

Introduction: Motion capture systems are used to track people's body movement (i.e. kinematics) in gait and balance research. Recently, portable wearable inertial measurement unit (IMU) systems have been developed, allowing kinematic recording inside or outside the lab. To utilize these IMU systems, their reliability must be established.

Purpose: The study purpose was to examine test-retest reliability of a commercial IMU motion capture system for gait and balance measures.

Methods: Seven male and two females (26.8 ± 4.3 years) walked 20 meters in a straight line several times at self-selected velocities in two identical analysis sessions, 2-8 days apart. An IMU system (Xsens Awinda, $f_s = 60$ Hz) collected full-body 3D kinematic data. Data were separated into individual strides and averaged across trials for each session. Outcomes included spatiotemporal variables: stride velocity, cadence, stride length, double support, step width and step length, and balance measures: medio-lateral (ML) and anterior-posterior (AP) margin of stability (MOS) and angular momentum. Intraclass correlations (ICC) and standard errors of measurement (SEM) were calculated to derive relative and absolute test-retest reliability respectively.

Results: The test retest reliability of the Xsens IMU motion capture system showed moderate to high level of test-retest reliability for all gait variables during walking. ICC ranged from 0.535 to 0.941. SEM ranged from 3.0% to 21.0% of the mean value. Cadence and ML minimum MOS represented the highest and lowest reliability respectively.

Discussion: While more participants are needed for this study, the current results of this pilot work support the use of this inertial system to measure dynamic balance measures during walking.

Acknowledgments: Dr. Alison Oates & Kirat Shukla

The effects of postactivation potentiation on vertical countermovement jump height

Student: Kalie Schemenauer

Theme: Human Performance

Supervisor: Bart Arnold

Introduction: Postactivation potentiation is a phenomenon in which the application of a heavy load with few repetitions prior to an activity increases force production for that activity. Previous studies have found postactivation potentiation can lead to temporary improvements in sport-related measures such as vertical jump height and sprinting speed. A possible mechanism for this increased force production is due to greater motor unit recruitment from the central nervous system. The purpose of this study was to determine if performing a barbell back squat at a load of 85% of 1 repetition maximum (1 RM) for 4 repetitions would increase subsequent vertical jump heights.

Methods: Participants completed a virtual familiarization session via WebEx one week prior to the in-lab visit to review proper vertical jump and squat mechanics. Participants then determined their squat 1 RM using the CSEP predictive formula, which involves squatting a weight that causes fatigue in 6-10 repetitions. This was done within 48 hours after the familiarization session. The in-lab visit included the following: two vertical jumps, then 4 squats at 85% of 1 RM for 4 repetitions, and finally vertical jumps 4, 8, and 12 minutes after completing the squats.

Results: Participants ($n = 10$) averaged a vertical jump height of 61 cm before performing squats. Mean vertical jump height decreased at the 4 minute mark ($\mu = 58.8$ cm) and the 8 minute mark ($\mu = 59.55$ cm) after the 4 repetitions of the 85% of 1 RM squat load. Mean jump height slightly increased ($\mu = 61.2$ cm) at the 12 minute mark after the 4 repetitions at 85% of 1 RM squat load. There is no statistical significance across any time point.

Conclusion: Squatting 85% of 1 RM for 4 repetitions did not increase subsequent vertical jump height. Future research could explore different intensity and repetition combinations, different exercises, or utilize a larger sample size.

How are sex- and gender-based analyses included in current research examining walking?: A Scoping Review

Student: Jasmine Petit

Theme: Human Performance

Supervisor: Dr. Alison Oates

Introduction. Walking is an important part of most people's everyday lives. However, sex- and gender-based analyses (SGBA) of these studies have not been sufficiently considered. When looking at the literature, the current relevance and completeness of research findings related to sex and gender is unknown and the reporting is inconsistent. SGBA allows researchers to study influences of sex and gender in walking research as well as creates a sense of inclusivity and acceptance.

Purpose. To examine the current state, including frequency and accuracy, of SGBA in walking research, and to guide future SGBA for walking research.

Methods. Search strategies were formulated for six different databases to examine the research question. After deduplication of results, inclusion and exclusion criteria were applied by two independent reviewers to screen both abstracts and full text articles. Twenty articles were used for data extraction that included forty-five coded questions. Fourteen key questions were chosen from the data extraction sheet to be further analysed.

Results. Only 5% and 10% of articles included sex or gender, respectively, in the research question/hypothesis/purpose. Sixty percent included clinical populations, 35% included healthy populations, and 5% did not report the health status of the participants. Twenty percent and 15% of studies included sex or gender as a factor in statistical analyses, respectively. It was also found that 25% and 10% of studies disaggregated data by sex and gender, respectively. Furthermore, 5% and 10% of the studies included discussions of sex or gender, respectively, in the limitations. Lastly, 35% of studies always reported sex and gender accurately, 20% of articles sometimes reported sex and gender accurately, and 45% of articles did not report sex and gender accurately.

Conclusion. Greater than 50% of articles with a focus on walking research lacked sufficient reporting of SGBA. In the articles that did include these analyses, greater than 50% of reporting of sex and gender was inaccurate.

The state of sex- and gender-based analysis in standing balance research

Student: Alexa Koupantsis

Theme: Human Performance

Supervisor: Dr. Alison Oates

Introduction: Standing balance is very important for many aspects of daily life. Some research has examined effects of sex or gender on standing balance; however, reporting of sex and gender lacks consistency and sex- and gender-based analyses (SGBA) are often applied inaccurately. SGBA are important for creating relevant, inclusive, and accurate research. The current state of SGBA in standing balance research is unclear.

Purpose: To determine the current state of SGBA in standing balance research, examine the frequency and accuracy of SGBA in standing balance research, and guide future SGBA in standing balance research.

Methods: Scoping review limited to peer-reviewed journal articles in 2020. Search strategies and inclusion and exclusion criteria were created with support from a librarian. 25 studies were randomly selected from the original search to test inclusion and exclusion criteria. Each study was evaluated by at least two researchers. Evaluation included abstract screening, full-text screening, and data extraction from 20 articles.

Results: 10% of articles referenced sex and 0% referenced gender in the purpose, research question(s), or hypothesis/es. All articles mentioned either sex (85%) or gender (15%) of participants. No articles mentioned how sex or gender data were collected. 15% of articles completed statistical analyses with either sex (10%) or gender (5%) as factors and disaggregated data accordingly. 15% of articles considered sex in the limitations, and none considered gender. 45% of articles always reported sex and gender accurately, 45% sometimes reported accurately, and 10% never reported accurately. 91% of articles that sometimes or never reported accurately used gender-based terminology to describe sex-based concepts.

Conclusion: All standing balance research reported sex or gender of participants. Most (85%) did not include SGBA. Almost half (45%) of the articles always used accurate sex and gender terminology. One limitation is that no articles described how sex and gender data were obtained. This makes discussing accuracy of terminology difficult. Future research should include how sex and gender data were obtained, analyze sex and gender differences, and use appropriate sex and gender terminology.

Self-perceived heart disease risk in South Asian Canadians

Student: Saiyuga Suthaakarann

Theme: Healthy Aging & Management

Supervisor: Dr. Corey Tomczak

of Chronic Conditions

Introduction: South Asians are the fastest growing minority population in Canada. They have a higher prevalence of heart disease compared to other ethnic groups. A language barrier is a key factor driving lack of knowledge and misconceptions in modifiable cardiovascular risk factors. Language barrier may be different between those South Asians born in Canada (*i.e.* second-generation) compared to those who immigrated to Canada (*i.e.* first-generation). As such, the perception of risk may be different between first- and second-generations of South Asians in Canada.

Purpose: To investigate the perception of heart disease risk between Tamil Sri Lankan first generation immigrants and second-generation Tamil Canadian-born Sri Lankans and to assess if the perception of risk of getting heart disease is different between generations. We hypothesized that the younger generation would have a higher perception of getting heart disease compared to the older generation of Tamil Sri Lankans in Canada.

Methods: We had 148 Tamil Sri Lankans in Canada complete an online Perceived Risk of Heart Disease Scale questionnaire to assess their perception of risk of getting heart disease. Participants were split into young ($n = 107$; $M_{age} = 25 \pm 6$ years) and 41 older ($n = 41$; $M_{age} = 57 \pm 7$ years) groups. Each item on the 20-item questionnaire is scored on a continuum of higher perception to lower perception. The risk perception scores are then split into three categories: dread risk (7 questions), risk (6 questions), and unknown risk (6 questions). Dread risk is perceived as lack of control of getting heart disease; risk is perceived as having moderate awareness of getting heart disease; and unknown risk is perceived as being unaware of their risk of getting heart disease.

Results: The older group had significantly greater dread risk (2.3) and risk (3.1) scores compared to the younger group (1.9, $p = 0.021$; 2.7; $p = 0.001$, respectively). Unknown risk was significantly greater in the younger group (3.0) compared to the older group (2.8; $p = 0.025$).

Conclusion: The first-generation South Asian sample had significantly lower knowledge of heart disease risk compared to their younger, second-generation counterparts.

Acknowledgements: Dr. Corey Tomczak, Dr. Kathryn King, & Natashas Boyes, MSc

Exploring physical literacy development through multi-activity engagement

Student: Fatima Ali

Theme: Child & Youth Health and Development

Supervisors: Dr. Louise Humbert & Ms. Natalie Houser

Introduction: Physical literacy is the motivation, confidence, physical competence, knowledge, and understanding to value and take responsibility for engagement in physical activities for life. Physical literacy is considered a gateway to lifelong physical activity participation. It is a concept that influences holistic physical activity participation in a wide range of physical environments. Physical literacy resources such as Sport for Life suggest multi-sport and multi-activity involvement; however, this has not been extensively explored.

Purpose: The purpose of this study was to explore how participation in multiple activities influences the development of components of physical literacy (motivation, confidence, physical competence, knowledge, and understanding).

Methods: This study is a quantitative cross-sectional design. Physical literacy was measured using the Physical Literacy Assessment for Youth (PLAY) tools (PLAY fun and PLAY self), and activities were measured using the Physical Activity Questionnaire for Older Children (PAQ-C). Descriptive statistics, correlation analysis, and t-test analysis were done to compare multiple activity participation and children's perceived and observed physical literacy. Significance was set at $p < 0.05$.

Results: In a sample of 170 (87 girls, 83 boys) children aged 8-14 years (mean = 10.9), significant correlations were observed between the number of activities performed and environmental participation ($r = 0.396$, $p = 0.001$), and between the self-description of physical literacy and number of activities ($r = 0.417$, $p = 0.001$). No significant correlation was found between the number of activities performed and average motor competence ($r = 0.077$, $p = 0.319$).

Conclusion: This study is one of the first to examine the relationship between multi-activity participation and physical literacy. The findings suggest that multi-activity participation may offer children an opportunity to be exposed to a wide range of physical environments, and therefore develop greater confidence and motivation in various environments. Additionally, the results suggest those engaged in more activities have increased confidence in their capabilities and thus portray greater perceived physical literacy. Further research is needed to expand on our current understanding of the impact of multi-activity participation on components of physical literacy.

Acknowledgements: Dr. Louise Humbert, Ms. Natalie Houser, & Dr. Jon Farthing

Post-Doctoral Fellow & Faculty Presentation Schedule

TUESDAY MARCH 30TH – 11:30 AM – 1:00 PM CST

11:30 Brief welcome by Justin Pifko

11:35 Dr. Kenzie Friesen Post-Doctoral Fellow

Is sporting task movement variability associated with athlete body composition?

Theme: Human Performance

11:55 Dr. Adam Baxter-Jones Faculty

From punk to professor: My research career 1981-2021

Theme: Child & Youth Health and Development

12:15 Dr. Saija Kontulainen Faculty

Bone fragility prevention: Working against gravity

Themes: Healthy Aging and Management of Chronic Conditions; Child & Youth Health and Development; Human Performance

12:35 Dr. Phil Chilibeck Faculty

The effects of wearing a face mask on exercise performance

Theme: Human Performance

Honours Student Presentation Schedule

WEDNESDAY MARCH 31ST – 1:30 – 3:30 PM CST

1:30	Brief welcome by Dr. Jon Farthing	Supervised by:
1:30	Abdirahim Absher	Dr. Phil Chilibeck
1:45	Iqbal Azhar	Dr. Phil Chilibeck
2:00	Kaitlyn Benko	Dr. Kevin Spink
2:15	Alexandra Bristow	Dr. Marta Erlandson
2:30	Sam Girgis	Dr. Heather Foulds
2:45	Omar Hafez	Dr. Heather Foulds
3:00	Aafia Maqsood	Dr. Saija Kontulainen

Effects on metabolism of consuming low and high glycemic index carbohydrates prior to intermittent sport; A meta-analysis

Student: Abdirahim Absher

Theme: Human Performance

Supervisor: Dr. Phil Chilibeck

Introduction: Carbohydrate consumption is important for athletes involved in sports that requires continuous activity (i.e. cycling, running); however, there is limited research that assesses the effect of consuming carbohydrates of different glycemic indexes in sport that is more intermittent in nature (e.g. soccer). Carbohydrates can be classified as either low (LGI) or high glycemic (HGI) index depending upon the rate in which glucose and insulin levels rise in the blood after consumption. It was hypothesized that metabolic profile of intermittent sport athletes would improve with the consumption of low LGI carbohydrates before and during competition compared with HGI carbohydrates.

Purpose. To compare the effects of consuming LGI vs HGI carbohydrates metabolic profiles (e.g. fat and carbohydrate oxidation, glycogen sparing, blood insulin and glucose levels, lactate production) when consumed prior to engaging in intermittent sport.

Methods: A meta-analysis was used to assess the effects of glycemic index on metabolic variables during intermittent sport. 14 relevant studies were found after conducting a literature search on databases including PubMed, Sport Discus and Google Scholar using search terms such as glycemic, intermittent, soccer, rugby, hockey, and interval. Inclusion criteria included studies that compared a low-glycemic index to a high-glycemic index condition. The quality of the literature used in the study was assessed using the Cochrane risk-of-bias tool. RevMan software was used to conduct meta-analyses. Outcomes assessed included variables such as carbohydrate and fat oxidation, muscle glycogen, and blood concentrations of lactate, insulin, and glucose.

Results: Fat oxidation, insulin, lactate, and muscle glycogen levels were found to be statistically significant between LGI and HGI conditions when these carbohydrates were consumed before intermittent sport. Mean differences for fat oxidation, insulin, lactate, and muscle glycogen are 0.02 g/min (P = 0.002, favouring LGI), 13.45 pmol/L (P = 0.00001, HGI), 0.05 mmol/L (P = 0.0002, HGI), 1.37 (P = 0.0007, LGI), respectively.

Conclusion: Consuming LGI carbohydrates enhanced the metabolic profiles of intermittent sport athletes by lowering lactate and insulin levels, sparing muscle glycogen stores, and improving fat oxidation rates.

A meta-analysis of high versus low GI foods' effects on sports performance

Student: Iqbal Azhar

Theme: Human Performance

Supervisor: Dr. Phil Chilibeck

Introduction: The intake and usage of carbohydrates is crucial for an athlete's performance in high intensity activities such as those seen in intermittent sports like soccer (Andersone & Ozolina-Moll, 2018). One of the primary reasons of fatigue for athletes is a depletion of glycogen (Quinones & Lemon, 2019). Research suggests that a slower release of glucose and insulin in blood from low glycemic index (GI) foods may be beneficial for an athlete as it results in the body shifting to fat oxidation and therefore reserving the body's glycogen (Bennett et al., 2012). Although low GI foods do seem like the suitable option for many athletes, studies on consuming foods of different GIs before intermittent sport are mixed on whether low GI foods are superior for performance. Therefore, conducting a meta-analysis would help to provide more conclusive results.

Methods: A meta-analysis was run using RevMan software to determine whether sport performance differed between conditions where low versus high-GI foods were consumed before intermittent sport activity. The Cochrane Risk of Bias tool was used to assess risk within the studies included in the meta-analysis.

Results: Running and sprint-based performances were not statistically different between high and low-GI conditions ($p = 0.82$). Other sport-related outcome measurements (agility, vertical jump heights, rating of perceived exertion, ball dribbling) were also not different between high and low GI conditions ($p = 0.39$ to $p = 0.91$).

Conclusion: Despite theoretical metabolic benefits of consuming low GI foods, they do not appear to confer benefits on performance compared to consumption of high GI foods.

Acknowledgements: College of Kinesiology Honours Program, Dr. Jon Farthing for coordinating, and Dr. Phil Chilibeck for supervising.

Physical activity adequacy and physical activity – Exploring antecedents, moderators, and mediators

Student: Kaitlyn Benko

Theme: Healthy Aging & Management

Supervisor: Dr. Kevin S. Spink

of Chronic Conditions

Introduction: There is a growing body of research illustrating the predictive effects of psychological mindsets on health behaviors (Shakya et al., 2015; Turnwald & Crum, 2019) and physiological health outcomes (Crum & Langer, 2007; Crum et al., 2013; Crum et al., 2011). In contrast, only one study has assessed perceived activity adequacy mindset – a measure assessing whether or not individuals perceive their own physical activity (PA) levels as being adequate enough to be considered healthy. In that study, those who perceived their PA as adequate reported increased PA engagement (Zahrt & Crum, 2020).

Purpose: The current study aims to examine antecedents of perceived activity adequacy (i.e., perceived activity social comparison) and whether this relationship might be moderated by awareness of Canada's PA guidelines. A second purpose is to examine whether activity adequacy will mediate the relationship between perceived activity social comparison and self-reported PA.

Methods: Participants completed two online surveys eight days apart. The first survey assessed demographic information, activity social comparisons, PA guideline knowledge, perceived activity adequacy mindset, and typical exercise behaviors (N = 187). Survey two assessed current exercise behaviors (N = 135).

Results: Perceived activity social comparison was positively related to PA adequacy ($p = .016$). It was found that knowledge of the PA guidelines did not moderate the relationship between activity social comparison and perceived activity adequacy mindset ($\beta = .293$, $t(185) = 1.67$, $r_{\text{partial}} = .12$, $p < .097$). In terms of mediation, social comparison was positively related to self-reported PA, $F(1,133) = 46.54$, $p = .000$. Together, social comparison and perceived PA adequacy were positively associated with self-reported PA, $F(2, 132) = 29.45$, $p = .000$, accounting for 31 percent of the variance in self-reported PA. When adequacy was included, the relationship between social comparison and self-reported PA was no longer significant, suggesting full mediation.

Conclusion: This study replicated and extended Zahrt & Crum's (2020) findings to include social comparison as an antecedent. Additionally, the results provide initial evidence that social comparison predicted perceived activity adequacy and that adequacy mediates the social comparison/PA relationship. While promising, these results require replication.

Keywords: Perceived activity adequacy mindset, social comparison, self-reported physical activity

Menstrual function and dysfunction rates and experiences in female athletes

Student: Alexandra Bristow

Theme: Human Performance

Supervisors: Drs. Marta Erlandson & Margo Adam

Introduction: Menstrual dysfunction is not an uncommon phenomenon in female athletes, with the majority of them reporting dysfunction in their menstrual cycle. Many female athletes also perceive their menstrual cycle as negatively affecting their performance, possibly creating an overall negative experience in the sport. Currently, our understanding of the menstrual cycle and its impact on sport remains physiological, with little knowledge of female athletes' in-depth lived experiences. Additionally, it has been found that menstrual dysfunction rates differ between leanness and non-leanness sports; however, it is unknown if there is variation within sports based on competition level.

Purpose: To explore if menstrual function/dysfunction rates and experiences differ between levels of competition within female athletes.

Methods: An online embedded mixed-methods study was conducted, which integrated qualitative and quantitative data to represent all aspects of the study. Participants (n = 63) aged 14 to 39 were gathered using snowball sampling. Data was collected using an online conversation-style survey that was designed to imitate a one-on-one interview. Data was first analyzed using various quantitative measures, such as descriptive statistics and independent t-tests. Subsequently, data was coded by hand and analyzed for themes.

Results: After completing the quantitative data analysis, no significant differences were observed from the variables between competition levels. Qualitative data analysis resulted in three generated themes. The first theme, attitude, describes the participant's feelings and thoughts about menstruation. The second theme, symptoms, deals with the females' expressed symptoms due to their menstrual cycle. The third theme, impact, describes how the menstrual cycle impacts participant's daily lives, ultimately influencing their participation in sport.

Conclusion: In contrast to previous research, no differences were found among competition levels for both menstrual dysfunction rates and experiences within female athletes. However, generally female athletes perceived their menstrual function as having a negative impact on their sport experience. Highlighting that dysfunction rates and experiences are common among female athletes.

Acknowledgements: I would like to thank my supervisors, Marta Erlandson and Margo Adam, for their guidance through each stage of this process.

Sex specific relationships of social support and sedentary behavior for Indigenous adults

Student: Samuel Girgis

Theme: Indigenous Wellness

Supervisor: Dr. Heather Foulds

Introduction: Ongoing colonization have led to elevated rates of chronic diseases and other low quality of life indicators among Indigenous Peoples of Canada. Sedentary behavior, activities with an energy expenditure below 1.5 METS, and social support, support an individual has due to their social ties, are among the proximal factors that play into this increased risk. While correlations between social support and sedentary behavior are unclear, social supports may vary by sex. A better understanding of the importance of social support and sex on sedentary behavior of Indigenous peoples is needed.

Purpose: Preliminary research has identified relationships between social support and sedentary behaviour of the Indigenous populations of the University of Saskatchewan. This study aims to evaluate the sex-specific relationships of social support and sedentary behaviour.

Methods: Indigenous adults 18 years and older at the University of Saskatchewan completed the Social Support Index, Family/Friend Support Questionnaire, and six sedentary behavior questions from the Canadian Community Health Survey. T-tests were used to identify the significant within-group differences of Métis, and First Nations males and females with regards to screen time, sedentary behavior, and various social supports.

Results: Of the 129 Indigenous participants, 97 were female. As such statistical power was not achieved among the low number of male participants. Among 32 Métis females, those reporting less daily screen time (4.0 ± 1.2 hours vs 5.5 ± 2.1 hours) had stronger ties to family and friends ($P < 0.05$), and greater community support ($P < 0.05$). First Nations females reported similar social supports among those with reporting higher and lower sedentary behavior and screen time ($P > 0.05$).

Conclusion: Whereas less screen time is associated with greater family, friend, and community supports in Métis females, the same pattern does not exist for First Nations females. Moreover, future research with larger sample sizes, particularly Indigenous males, is needed to identify further trends.

Acknowledgements: I'd like to acknowledge the Heart & Stroke Foundation and Canadian Institutes of Health Research who've helped to fund this project, and a huge thank you for the guidance of Varinder Brar, Avery Ironside, and Dr. Heather Foulds.

Understanding the experience of individual’s dancing the Red River Jig and how it affects their health and well-being

Student: Omar Hafez

Theme: Indigenous Wellness

Supervisor: Dr. Heather Foulds

Introduction: Traditional Métis activities such as the Red River Jig play an important role in maintaining and extending community which ties back to their health and well-being

Purpose: To gain a better understanding of the effects the Red River Jig has on the wholistic health of the dancers.

Methods: Adults (18 years and older) familiar with the Red River Jig and have been able to dance the Red River Jig "double step" completed individual or group Interviews. Thematic analysis of the transcripts identified important themes of impacts on wholistic health.

Results: From interviews with seven participants, five themes emerged. The first theme, “community as a determinant of health”, discusses the importance of community and how the Red River Jig brings community together. The second theme, “cultural rebirth” explored how many Métis individuals went through a cultural rebirth which greatly impacted wellbeing, which many attributed with the Red River Jig. The third theme, “positive impact on wholistic health”, related the Red River Jig to all aspects of health. The fourth theme, “self-identity”, describes the importance of identity in relation to health and how the Red River Jig has helped with Métis identity. The final theme, “Effects of colonization”, describes ongoing effects of colonization on Indigenous communities and how cultural factors such as the Red River Jig can play a role in healing.

Conclusion: The Red River Jig has a positive impact on the wholistic health and well-being of individuals. Additional research is needed to better understand how it can be utilized to improve health outcomes in Indigenous communities.

Nordic walking intervention for residents in long term care: Identifying care-leaders interests and preferences

Student: Aafia Maqsood

Theme: Healthy Aging & Management

Supervisor: Dr. Saija Kontulainen

of Chronic Conditions

Introduction: Residents in long term care homes are at increased risk of fracture. Risk factors for fracture include impaired balance, mobility, and posture. Nordic walking in community dwelling older adults has shown to be safe as well as decrease these risk factors. However, there is no evidence if residents of long- term care would benefit from Nordic walking.

Objective: To contact care-leaders of the long-term care homes in Saskatoon and inquire their interest to co-design a Nordic walking intervention, and availability of related personnel and infrastructure at their facility.

Methods: This cross-sectional study involved emailing a 7-question survey to 30 care-leaders of long-term care homes in Saskatoon. I used descriptive statistics to characterize interest among responders, available personnel and infrastructure.

Results: The response rate was 27% and out of the 8 facilities that responded to the survey, 6 showed an interest in co-designing the intervention (75%). One facility had a day program, 1 had trained personnel, 1 had poles available, 6 had an indoor walking space available and 6 had an outdoor walking space available.

Conclusion: Majority of care providers who responded to the survey were interested in co-designing this intervention. The next step will be to contact these facilities and work alongside residents, care-providers, and residents' families to create a patient-oriented approach to a Nordic walking intervention for residents to see if they will receive benefits from this.

Graduate Student Presentation Schedule

THURSDAY APRIL 1ST – 2:00 – 4:00 PM CST

2:00	Brief welcome by Justin Pifko		Supervised by:
2:00	Matthew Chapelski	MSc	Dr. Marta Erlandson
2:15	Mahdi Rostami Haji Abadi	PhD	Dr. Saija Kontulainen
2:30	Jackson Lordall	MSc	Dr. Joel Lanovaz & Dr. Alison Oates
2:45	Adam Luchkanych	MSc	Dr. Corey Tomczak
3:00	Justin Pifko	MSc	Dr. Joel Lanovaz
3:15	Nathan Reis	PhD	Dr. Kent Kowalski

Are the bone health benefits observed in young recreational gymnasts still present in adolescence?

Student: Matthew Chapelski

Theme: Child & Youth Health and Development

Supervisor: Dr. Marta Erlandson

Full Author List: Matthew Chapelski, Margo E. K. Adam, Adam D. G. Baxter-Jones, & Marta C. Erlandson

Introduction: Our previous research has found that recreational gymnasts 4-8 years of age have greater bone strength at the wrist; however, it is unknown if these benefits persist into adolescence. Therefore, the purpose of our study was to assess if the improvements in bone health in young children maintained into adolescence.

Methods: 39 recreational gymnasts (19 F) and 32 physically active controls (19 F), were assessed for anthropometrics, physical activity (PA) and peripheral quantitative computed tomography (pQCT) scans in childhood (7.2 ± 1.3 years) and in adolescence (14.2 ± 1.3 years). PA was assessed using the Netherlands Physical Activity Questionnaire (NPAQ) and the Physical Activity Questionnaire for Adolescents (PAQ-A). pQCT scans were obtained on the non-dominant radius and tibia (4% and 66% the limb length respectively). Group means were compared using *t*-tests and adjusted means using multivariate analysis of covariance (controlling for sex, age, biological age, height, weight and PA).

Results: No significant differences were found in any anthropomorphic or PA variables ($p > .05$), except for weight which was greater in gymnasts at adolescence ($p = .020$). During childhood gymnasts had significantly greater estimated bone strength at the wrist ($p = .046$). The only significant difference in bone parameters during adolescence was found at the distal radius, with gymnasts demonstrating greater values ($p = .015$).

Conclusion: The higher bone strength index at the wrist observed in young recreational gymnasts was no longer apparent in adolescence. However, total bone content was higher in adolescence. These findings suggest impact loading activities need to be maintained during childhood and adolescence.

Acknowledgements: We gratefully acknowledge the study participants and their families for their enthusiasm and commitment to the project.

Keywords: Bone health; Physical activity; Adolescence

Bone health in children and youth with ASD: A systematic review and meta-analysis

Student: Mahdi Rostami Haji Abadi

Theme: Child & Youth Health and Development

Supervisor: Dr. Saija Kontulainen

Full Author List: Mahdi Rostami Haji Abadi, Ann Neumeyer, Madhusmita Misra, & Saija Kontulainen

Introduction: Higher risk of fracture reported in individuals with autism spectrum disorder (ASD) might be linked to poor bone health and development in childhood. We aimed to systematically review studies comparing imaged bone outcomes between children with ASD and typically developing children (TDC) or reference data, and perform a meta-analysis comparing commonly reported bone outcomes.

Methods: We searched articles published since August 2020 from PubMed, Cochrane Library, Web of Science, EMBASE and Scopus databases. We included studies comparing areal bone mineral density (aBMD) between children with ASD and TDC in the qualitative analysis (meta-analysis), and evaluated other imaged bone outcomes qualitatively.

Results: Seven publications were identified for the systematic review, and four studies were included in the meta-analysis. The meta-analysis indicated lower aBMD at the total body (standardized mean difference = -0.77; 95% CI, -1.26 to -0.28), lumbar spine (-0.69; -1.00 to -0.39), total hip (-1.00; -1.82 to -0.17) and femoral neck (-1.07; -1.54 to -0.60) in children with ASD compared to TDC. Based on our qualitative review, limited evidence suggested 13% lower bone mineral content at the total body and 10-20% lower cortical area, cortical and trabecular thickness and bone strength at the distal radius and tibia in children with ASD.

Conclusion: Children with ASD have lower aBMD at the total body, lumbar spine, hip and femoral neck compared to TDC. Limited evidence also suggests deficits in bone mineral content, micro-architecture and strength in children with ASD.

Acknowledgements: The study received funding from the University of Saskatchewan One health grant.

Keywords: Bone health; Growth and development; Autism spectrum disorder; Bone mineral density; Bone micro-architecture; Bone strength; Risk of fracture; Meta-analysis

Exploring the influence of settings on spatiotemporal stride parameters during walking at different speeds in young adult males and females

Student: Jackson Lordall

Theme: Human Performance

Supervisor(s): Dr. Joel Lanovaz & Dr. Alison Oates

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Introduction: Wearable technology allows quantitative examination of walking outside of laboratory settings. Past research suggests there can be differences in stride parameters between settings; however, studies differ in methodology and no studies have compared more than two settings. This study explored how stride parameters are influenced across multiple settings for young adult males and females during walking at different self-selected speeds.

Methods: In a block randomized design, participants walked in four settings (laboratory, hallway, indoor open, outdoor pathway) at three speeds (slow, preferred, fast) following standardized instruction. An inertial-based full body kinematic data collection system was worn; collecting stride velocity, stride length, and cadence for the middle strides of each trial. A 4 x 3 x 2 (setting x walking speed x participant sex) RM ANOVA was conducted for each dependent variable. Significant interaction effects were further investigated using multiple RM ANOVAs with adjusted pairwise comparisons.

Results: A total of 14 males (age = 23 ± 4 yrs; height = 181 ± 7 cm; mass = 79 ± 1 kg) and 15 females (age = 22 ± 4 yrs; height = 170 ± 7 cm; mass = 70 ± 2 kg) participated. Statistical analysis indicated significant setting x speed interactions for stride velocity ($p = .021$), stride length ($p < .001$), and cadence ($p = .002$). There were significant main effects of participant sex: females had greater cadence ($p = .013$) and males had larger stride lengths ($p = .023$).

Conclusion: The effect of setting depended on walking speed. There were greater effects of setting on stride parameters at slow and preferred speeds. Generally, the lab and hallway were similar, and the indoor open and outdoor pathway were different. These findings suggest that laboratory-based assessments of walking may not reflect walking outside of laboratory settings. The sex-based differences highlight the importance of considering sex as an independent factor to improve walking data interpretation. Further research in different settings for older adult and clinical populations is important to assess the ecological validity of laboratory-based walking assessments.

Acknowledgments: National Sciences and Engineering Research Council (NSERC); Biomechanics of Balance and Movement Lab

Keywords: Walking; Wearable sensors; Ecological validity

ATP attenuates adrenergic and peptidergic vasocontraction in cerebral arteries

Student: Adam Luchkanych

Theme: Healthy Aging & Management

Supervisor: Dr. Corey Tomczak

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Introduction: Competing influences regulate blood flow control in the brain. In the skeletal muscle vasculature, purinergic signaling attenuates α_1 -adrenergic and peptidergic-induced vasoconstriction (*i.e.*, *phenomenon referred to as functional sympatholysis*). Whether this occurs in the cerebrovasculature remains unknown. The purpose of this study was to determine the influence of ATP on α_1 -adrenergic and peptidergic-mediated vasocontraction in cerebral arteries. We hypothesized that ATP would attenuate the α_1 -adrenergic- and peptidergic-mediated vasocontraction in isolated pial arteries.

Methods: Female pigs (n = 5) were euthanized and their brains were harvested. Thereafter, 1a branches (mean ID: 319 μ m) of the middle cerebral artery (MCA) were dissected for wire-myography. Dose-response curves for the α_1 -adrenergic agonist phenylephrine (PE) ($1e^{-10}$ - $1e^{-4}$ M) and for the peptidergic agonist NPY ($1e^{-12}$ - $1e^{-6}$ M) were performed in the absence or presence of ATP ($1e^{-6}$ M). A two-way repeated measures ANOVA and paired, one-tailed t-tests were performed where appropriate.

Results: The overall magnitude (area under the curve) of PE mediated cerebral vasocontraction was attenuated by ATP ($p = 0.03$). However, reductions in the maximal response to PE in arteries pre-treated with ATP were not significantly different ($p = 0.10$). The overall magnitude as well as maximal NPY mediated cerebral vasocontraction was attenuated by ATP ($p \leq 0.05$).

Conclusions: ATP attenuates PE- and NPY-mediated cerebral vasocontraction. Therefore, similar to the skeletal muscle vasculature, purinergic signaling attenuates vasoreactivity to α_1 -adrenergic and peptidergic receptor activation in the cerebrovasculature. Functional sympatholysis may assist in coupling cerebral blood flow to brain metabolism in the setting of heightened sympatho-excitation.

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Keywords: Cerebral blood flow; Functional sympatholysis; Adenosine triphosphate; Adrenergic; Peptidergic

Biomechanics of older men and women during controlled forward descents in response to Fall Arrest Strategy Training (*FAST*)

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Theme: Healthy Aging & Management

Supervisor: Dr. Joel Lanovaz

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Introduction: Reaching hands forward to protect the body from injury is a common reaction during forward falls. Improving upper body capacity to effectively land and descend may help to mitigate forward fall-related injuries in older adults. The purpose of this study was to determine sex-related biomechanical changes and quantify fall arrest capacity in older adults in response to a unique intervention program, Fall Arrest Strategy Training (*FAST*).

Methods: *FAST* was led by two physical therapists for 45 minutes twice per week for 12 weeks to improve upper extremity (UE) strength, reaction, and movement time along with fall prevention goals.

Participants completed lab-based testing at Baseline, Pre (after a 12-week control), and Post (after *FAST*). Testing consisted of three push-up-like descents at 60° from horizontal starting with 90° shoulder flexion, elbows extended, and hands shoulder-width apart with an end target of 90° elbow flexion in 1.5s.

Bilateral force platforms (OR6-7, AMTI, $f_s = 2000\text{Hz}$) collected reaction forces while a motion capture system (VICON, $f_s = 200\text{Hz}$) recorded bilateral 3D UE kinematics. Outcome variables included elbow range of motion (eROM), maximum ground reaction forces (mxGRF), and overall energy absorption (OE). Independent *t*-tests compared sex demographics and 3 x 2 (time x sex) mixed-design ANOVAs examined outcome variables.

Results: Fifty-five participants (29 women) completed all testing sessions. Age ($\bar{x}_{\text{Men}} = 73.5 \pm 8.2$ years, $\bar{x}_{\text{Women}} = 69.7 \pm 6.9$ years, range = 60-93 years, $p = 0.062$), body mass index (M: 28.7 ± 3.6 kg/m², W: 27.8 ± 5.5 kg/m², $p = 0.447$), and *FAST* attendance (M: $82.5 \pm 13.6\%$, W: $81.2 \pm 14.4\%$, $p = 0.722$) were similar by sex. eROM had no sex or time effects. mxGRF showed a main effect of time ($p < 0.001$, Base-Post, Pre-Post) and sex (M > W, $p = 0.007$). OE had a time main effect ($p = 0.018$, Pre-Post).

Conclusion: After *FAST*, participants shifted loading away from their upper extremity while descending, reducing upper extremity overall energy demands. While older men applied higher forces than older women, *FAST* had similar effects on controlled forward descent biomechanics.

Acknowledgements: Funding by Saskatchewan Health Research Foundation

Keywords: Biomechanics; Older adults; Fall risk; Intervention

“That’s how I am dealing with it – that *is* dealing with it”: Exploring men athletes’ self-compassion through the lens of masculinity

Student: Nathan Reis

Theme: Human Performance

Supervisor: Dr. Kent Kowalski

Full Author List: Nathan Reis, Kent Kowalski, Amber Mosewich, & Leah Ferguson

Introduction: Despite the growing body of literature in the field of athletes’ self-compassion over the past decade, studies with a focus specifically on men athletes are limited. In addition, although previous research suggests that differential representations of masculinity may impact men’s self-compassion uniquely, the link between men athletes’ self-compassion and masculinity is understudied. With masculinity-based negative evaluations being the source of many difficult experiences for men athletes, perhaps self-compassion can mitigate the impact of men’s challenges in sport. Thus, our research purpose was to explore men athletes’ lived experiences of self-compassion through the lens of masculinity.

Methods: Our methodological framework was an interpretive phenomenological analysis (IPA), which enabled us to place an emphasis on examination of personal lived experience, through the use of interpretive process of both the participant and researcher. We recruited 16 men athletes ($M_{\text{age}} = 21.4$ years; $SD = 3.7$) to participate in two semi-structured interviews with a reflexive photography task between interviews.

Results: The results of our study are framed within two overlying categories (i.e., masculinity, self-compassion), with multiple themes in each category. Our findings suggest that the men athletes in our study generally represent a version of masculinity that is accepting of non-traditional representations of masculinity (e.g. homosexuality), and they were open and willing to accept and embrace self-compassion, particularly if it helps them improve their sport performance.

Conclusion: We conclude that self-compassion can be a useful resource for men athletes, and future research should focus on developing and evaluating the effectiveness of a self-compassion intervention, with considerations given to the potential role of masculinity in men’s difficult sport experiences, tailored specifically for men athletes.

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Keywords: Self-compassion; Men athletes; Masculinity; Sport psychology