

## Undergraduate Research Symposium May 20, 2016 Mary Gates Hall

### Online Proceedings

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#### POSTER SESSION 4

Commons West, Easel 25

4:00 PM to 6:00 PM

##### **Association between Interleukin-6 Levels and Symptoms Following Mild Traumatic Brain Injury**

*Hannah Pankratz, Senior, Nursing*

*UW Honors Program*

*Mentor: Hilaire Thompson, Biobehavioral Nursing and Health Informatics*

Short-term inflammation processes are commonplace following traumatic brain injuries (TBI), as they are a normal defense mechanism the body elicits to heal itself. However, when prolonged or chronic, inflammation can become detrimental. One inflammatory cytokine, Interleukin-6, has been shown to be increased in cerebrospinal fluid and blood post-TBI. In other non-TBI related clinical studies, Interleukin-6 has been associated with pain, fatigue, sleep disturbance, and depression. In this study, we examined whether plasma levels of interleukin-6 were associated with a higher symptom levels of four symptoms (headache, fatigue, sleep disturbance and depression) in the post-acute phase in patients with mild TBIs. To answer this question, secondary data analysis from a study that is currently underway was used. In the parent study, interested participants were enrolled from the Harborview Medical Center ED if they were 21-54 years of age, had sustained a mild TBI within the last 24 hours, and met other inclusion/exclusion criteria which would have impacted the immune response. Endorsement of symptoms and total symptom burden at 3 and 6 months was measured using the Rivermead Post-Concussion Questionnaire. Interleukin-6 levels at 3 and 6 months post-injury were obtained from banked plasma samples using a multiplex assay (Millipore, Minneapolis, MN). The sample (N=84) had a mean age of 34.7 years (SD 9.4). At 3 months post-injury the percent of patients endorsing symptoms as a problem were, 35.9% for headaches, 44.9% for sleep disturbance, 50% for fatigue and 32% for feelings of depression. At 6 months, the percentage reporting the symptom was higher for headaches (38.2%). Data analysis is currently underway using chi-squared tests and regression analysis to assess for the association between Interleukin-6 levels. If such an association is shown, this understanding of disease progression in mild TBIs could bring new treatment modalities to the medical realm concerning chronic inflammation.

#### POSTER SESSION 4

Commons West, Easel 21

4:00 PM to 6:00 PM

##### **Evaluation of Fitness Zones in Seattle Parks: Understanding Park Users and Impact of Weather**

*Zi Ling (Jessica) Cheng, Senior, Nursing*

*UW Honors Program*

*Alexandra (Sasha) Facchini, Fifth Year, Nursing*

*UW Honors Program*

*Mentor: Erin Blakeney, Biobehavioral Nursing & Health Informatics, UW School of Nursing*

*Mentor: Nancy Woods, Biobehavioral Nursing*

The majority of Americans do not engage in regular physical activity. Fitness Zones, a program sponsored by The Trust for Public Land, aims to increase physical activity by providing free outdoor fitness equipment in public parks. This program has gained popularity across the United States; however, few evaluations exist on the effectiveness of the program. Additionally, the majority of previous Fitness Zones were installed in warm locations. The purpose of this study is to examine physical activity patterns of park users in two Seattle parks where Fitness Zones will be installed, as well as to evaluate the effect of weather on park attendance and Fitness Zone utilization in these participating parks. Data collection will be performed in two Seattle parks prior to installation of Fitness Zone equipment with follow up at one of the parks after installation using a combination of observation and survey/interviews of park users. Observations are performed using System of Observing Play and Recreation in Communities (SOPARC). Park attendance will be assessed using a Park User Log and weather condition data will be obtained through Underground Weather. Qualitative content analysis of park user responses and comparison of park user turnout during tolerable versus poor weather differentiated by temperature, wind speed, and precipitation will be used for analysis. In addition, we will use linear regressions to determine correlational strength between park user attendance and various weather conditions. The results will contribute to the understanding of park use, and how to improve physical activity levels of all people in Seattle parks. Results will also describe relationships between Seattle weather conditions, park user attendance, and Fitness Zone utilization. Ultimately, this study will add to the knowledge base about whether Fitness Zone installation in public parks is an effective method to in-

crease physical activity in the Seattle area.

## POSTER SESSION 4

Commons West, Easel 20

4:00 PM to 6:00 PM

### **Initiation and Maintenance of Participation in a Local Mall Walking Program**

*Evan Whitson, Fifth Year, Nursing*

*UW Honors Program*

*Kimberly (Kim) Pineda, Senior, Nursing*

*UW Honors Program*

*Mentor: Basia Belza, Biobehavioral Nursing & Health Informatics*

Mall walking has the potential to increase physical activity and improve overall health of older adults but there is insufficient research about how older adults initiate and maintain participation. Older adults are a growing demographic and over half do not meet the daily recommendations for being physically active. Malls provide a safe, convenient, free, flat surface, and accessible venue for older adults to walk. Additionally, benches, water fountains, close parking, and bathrooms make it an ideal walking environment. The purpose of this quality improvement project was to better understand mall walkers' reasons for initiating and maintaining walking in a local mall walking program. We partnered with a Seattle Parks and Recreation program called Sound Step Strollers that offered weekly mall walking in Seattle. We used a cross-sectional design and included one-on-one interviews and written surveys. Interviews were conducted in person over 6 weeks during mall walking hours and consisted of questions about motivators and barriers to walking. Attendees who listened to a presentation about walking at a local retirement community were invited to complete a written survey that consisted of questions about incentives to walking. Interviews of 9 mall walkers from Sound Step Strollers were conducted as well as 15 surveys from a local retirement facility after the walking presentation. Findings revealed that the primary motivator to participate in a mall walking program was to manage and improve physical symptoms from chronic illness (e.g. arthritis). Additional factors that impact participation in mall walking include the influence of social peers, proximity of walking programs, and that information about the program had been provided at community centers and senior buildings. These findings suggest that coordination between clinicians and mall walking programs could provide a safe and accessible transition of care as well as an opportunity for continued health maintenance for older adults.

### **Social Support Availability and its Relationship with Mild Traumatic Brain Injury Symptom Burden**

*Austin Thomas (Austin) Drake, Senior, Nursing*

*UW Honors Program*

*Mentor: Hilaire Thompson, Biobehavioral Nursing and Health Informatics*

Mild traumatic brain injuries (MTBI) affect millions every year. Symptoms are typically transient in nature but recovery time can span weeks to months. The neurobehavioral disturbances resulting from MTBI are associated with lower functional outcomes. Research suggests that well-developed social support networks contributes to improved health outcomes. However, less is understood regarding the existence of a relationship between social support networks and MTBI outcomes specifically. The objective of this study is to establish whether or not there is a relationship between social support availability and perceived symptom burden after MTBI. This study is a secondary analysis of data captured by the AIm:TBI study, which tests whether poorer outcomes from TBI in older adult survivors are associated with an altered post-traumatic immune response. In the parent study, participants were enrolled from the ED if they were 21-54 years of age and had sustained a MTBI within the last 24 hours (N=78). Social support was measured by the MOS-Social Support Scale (range 19-95; higher scores mean more social support). Endorsement of symptoms and total symptom burden at 3 and 6 months was measured using the Rivermead Post-Concussion Questionnaire (range 0-64; higher scores mean more burden). At baseline, the average social support score was 79.7 (SD 14.9). At 3 and 6 months post-injury the mean total symptom burden was 16.2 (SD 14.4) and 15.5 (SD 15.0) respectively. Analysis of the relationship between the two includes the assessment of relative influence of the type of social support received on symptoms. If the results of this study suggest that there is an inverse relationship between the severity of an individual's symptoms after MTBI and the quality of their social support network, it may justify the development of interventions to increase social support in specific areas in order to facilitate better outcomes for MTBI patients.

## POSTER SESSION 4

Commons West, Easel 24

4:00 PM to 6:00 PM