



Fall Research Day

November 8, 2017

Abstract Booklet

**Office of Research and Sponsored
Programs**

POSTER PRESENTATION ABSTRACTS

EASEL #1: The Effect of Reading Food Labels on Food Choice and Diet Quality: A Systematic Review

Ericha Grace (Nutrition)

Faculty Mentor: Alessandra Sarcona

Objective: To evaluate existing evidence of the relationship between reading food labels, food choice, and diet quality.

Methods: A systematic literature review was conducted and included articles from January 2010 through May 2017 regarding the use of food labels and the Nutrition Facts Panel and impact on consumers' food choice and diet quality. Studies were to be specific to reading labels on packaged food and were excluded if in regard to menu labeling. The Quality Criteria Checklist was used to evaluate each article included in the review.

Results: Of 428 articles screened, eight were included in the final review, six cross-sectional in design and two randomized control trials. Evaluation of the eight articles resulted in three positive ratings, four neutral, and one negative rating based on questions asked in the Quality Criteria Checklist. Five studies focused on food choice and three on diet quality, the majority of which discovered a positive relationship between label-reading and food choice and/or diet quality.

Conclusion: Existing research on reading food labels, food choice, and diet quality partially demonstrates a positive relationship, but the quality of studies assessed provides inconclusive evidence and fails to provide a definitive association. Further, more controlled research should be conducted to solidify this relationship.

EASEL #2: The Effects of a Six-Week Weight Loss Program on Muscular Strength and Endurance

Paul Stickles and Katie Cooper (Kinesiology)

Faculty Mentor: Melissa Whidden

Purpose: The purpose of this study was to determine if a weight loss program would result in increases in muscular strength and endurance.

Methods: To test muscular strength, shoulder press, bicep curls, squats, and dead lifts (RDL) were assessed using the 6 repetition maximum analysis. For core endurance, plank and six inches were performed for time. Whole body endurance was determined by measuring time to fatigue for high knees and wall taps. Variables were assessed before and after in thirty four sedentary adults. Subjects were required to participate in a boot camp program five days per week and follow a structured diet.

Results: There was a significant increase in squat strength (61 ± 8 lbs vs. 81 ± 9 lbs, $P < 0.001$) and RDL strength (75 ± 8 lbs vs. 90 ± 9 lbs, $P < 0.01$) following the program. Upper body strength increased in the shoulder press (40 ± 3 lbs vs. 44 ± 3 lbs, $P < 0.01$) and bicep curls (35 ± 2 lbs vs. 40 ± 2 lbs, $P < 0.01$). Core endurance improved in the plank ($P = 0.004$) and whole body endurance improved with wall taps ($P = 0.02$).

Conclusions: These data suggest that this weight loss program is effective in increasing both muscular strength and endurance. While these gains may clearly be the result of participating in an exercise program, further research can contribute to training specificity and the impact cardiovascular and weight training have in junction with a structured weight loss program.

EASEL #4: The Relationship Between Depression, Alcohol, Tobacco, and Other Drugs (ATOD) Among College Students from 2010-2015

Whitney Katirai, Christine Williams, Matin Katirai, and Shannon Fyalkowski (Health and Geography)

Objective: The purpose of the study was to determine the relationship between depression and ATOD among college students between 2010- 2015. For this study, ATOD will include alcohol, tobacco, marijuana, opioids and sedatives.

Methods: The NCHA survey data was used for analysis. Survey results included 200,000 US college student participants between 2010-2015. Items included in the survey measuring ATOD, depression and stress were analyzed.

Results: Rates of being diagnosed with depression (within the past 12 months) steadily increased every year from 2010 to 2015 from 9.75% to 13.06%. Results from the logistical regression analysis from the two separate models indicate that students who used cigarettes, alcohol, opioids, marijuana and sedatives were more likely to have been diagnosed with depression within the past 12 months, while controlling for campus size, public/private status, religion, race and gender. Specifically, students who used marijuana (OR = 1.524, 95% C.I. 1.495 – 1.554), cigarettes (OR = 1.978, C.I. 1.936 – 2.022) and sedatives (OR= 2.72, C.I. 2.637 – 2.805) were more likely to have been diagnosed with depression. Those who were female (OR = 1.978, C.I. 1.938 – 2.019) and Non-Hispanic white (OR = 1.585, C.I. 1.552 – 1.619) were also more likely to have been diagnosed with depression during the last 12 months compared to nonwhite females and all white and nonwhite males.

Conclusions: Student depression is increasing and student stress levels remain high. Teaching mental health first aid on college campuses can empower students to help their peers seek help for depression/anxiety. Using effective techniques to mitigate stress can help students throughout their lifetime.

EASEL #5: The effect of vitamin D supplementation on vitamin D status in pregnant women and infants: A systematic review

Melissa Fleck (Nutrition & Dietetics)

Faculty Mentor: Alessandra Sarcona

Objective: To evaluate the effect of vitamin D supplementation during pregnancy and early infancy on infant and maternal vitamin D status.

Methods: A systematic review of randomized controlled trials published between 2008 and 2017 was conducted using Medline, PubMed, Ebscohost CINAHL, and reference lists of retrieved literature. Studies included pregnant women with mean age \pm SD from 22.4 ± 3.5 to 34.5 ± 4.6 and infants from birth to 12 months of age. Participants included: either both women and infants, only women, or only infants, and were supplemented with vitamin D. Critical appraisal of each study was conducted using the Quality Criteria Checklist, which found an overall high validity.

Results: Eight studies met the inclusion criteria and were reviewed. Overall, the studies were consistent in showing that higher doses of vitamin D were effective in improving vitamin D status in infants and women. Two studies involved vitamin D supplementation in infants and six studies involved vitamin D supplementation in pregnant women. Two studies did not include a control group and one study had to discontinue interventions in one group of infants due to risk of hypercalcemia.

Conclusion: Daily vitamin D supplementation ranging from 600 IU to 2000 IU and monthly vitamin D supplementation ranging from 35,000 IU to 100,000 IU have been shown to effectively improve vitamin D status and decrease vitamin D deficiency in pregnant women and breastfed infants. Further studies are required to assess long-term effects of supplementation and optimal dose and frequency of supplementation.

EASEL #7: Lessons Learned from Cold-Calling Medication Assisted Treatment Facilities

Elizabeth Britton Mendenhall (Public Health)

Faculty Mentor: Whitney Katirai

Purpose: The purpose of this study was to verify the Medication Assisted Treatment (MAT) facility information provided by the State of Pennsylvania and the Substance Abuse and Mental Health Services Administration (SAMHSA) so that accurate data can be entered into GIS software to display the resources available in rural Pennsylvanian counties.

Methods: Using a database compiled from the State of Pennsylvania and SAMHSA, entries designated as MAT facilities were called to verify their current existence and the services they provide. An explanatory script was used for introduction and then upon agreement to participate, individuals were asked 12 questions concerning the facility's MAT services.

Results: Many entries were incorrect in the database and a small number of facilities were no longer operational. Addresses and phone numbers were inaccurately reported, as well as the level of services provided. Many individuals felt uncomfortable answering questions, or were unable to provide the information necessary to respond.

Conclusion: Cold-calling from an inaccurate database can be a difficult way to acquire information, particularly when dealing with a sensitive topic. When first calling, be prepared to alter the script to find the appropriate introduction that makes individuals feel confident and comfortable in answering questions. Be open to any unsolicited information offered and don't be afraid to further inquire over interesting or confusing statements. When forced to investigate the data, surprising and useful knowledge may add a new dimension to the research that was not previously explored.

EASEL #8: The Relationship between Grit, Self-Concept Clarity, and Conscientiousness among Undergraduate Freshman Nutrition and Dietetics College Students

Dara Dirhan (Nutrition)

Grit, conscientiousness, and self-concept clarity have been shown to be strongly related to one another in the literature and have further demonstrated to be predictive of retention, educational attainment, and goal achievement. While this has been well documented in the study of child, military, and teacher populations, little is known about the correlation of these three variables among the college student population. Further, there is no existing literature to document the correlation of these variables among the undergraduate nutrition college student population. Therefore, the purpose of this cross-sectional study was twofold: first, to measure the level of grit, self-concept clarity, and conscientiousness among freshman nutrition and dietetics undergraduate college students, and second, to investigate the relationships between grit, self-concept clarity, and conscientiousness among this group.

EASEL #9: Effects of a Short-Term Neuromuscular Training Program on Jump Performance and Landing Mechanics

Tyler D. Whitacre, Chris E. Toland and Kenneth P. Clark (Kinesiology)

Faculty Mentor: Kenneth Clark

Non-contact knee injuries are prevalent in sports involving jumping and cutting. Implementing an effective training protocol can be challenging due to restrictions from the academic calendar and rules of the athletic governing body.

Purpose: Investigate changes in jump performance and jump landing mechanics in collegiate team sport athletes after a short-term neuromuscular training (NMT) protocol.

Methods: 9 healthy athletes (6 females, height = 1.60 ± 0.02 m, mass = 59.4 ± 5.1 kg; 3 males, height = 1.71 ± 0.07 m, mass = 69.8 ± 13.6 kg) volunteered and provided written informed consent. The pre- and post-test measure was a repeat vertical jump task, where subjects performed two consecutive jumps aiming to maximize height and minimize ground contact time (GCT). Subjects performed three trials with one-minute rest between each trial. Two cameras (60Hz) filmed trials from the frontal and sagittal plane. Variables of interest were Vertical Jump Height (VJH), GCT, Reactive Strength Index (RSI), and Landing Error Scoring System (LESS). Video review was used to determine GCT and flight time, with VJH calculated from flight time ($VJH = 1/8 \cdot g \cdot t^2$). Two investigators analyzed landing mechanics using LESS. NMT protocol included 12 one-hour sessions over six weeks, on non-consecutive days (Mon-Thu). Each session included warm-up, jump training, sprint training, and strength training.

Results: Effect Size (ES) statistics were calculated for each variable. Improvements were seen in RSI, GCT, and LESS, with ES values of 2.2, 1.5, and 0.6, respectively. VJH showed only trivial changes ($ES < 0.2$).

Conclusion: A short-term NMT program can improve jump landing mechanics and enhance performance in explosive jumping tasks.

EASEL #11: The Effect of Dietary Nitrates on Exercise Capacity in Chronic Kidney Disease

Meghan G. Ramick, Danielle L. Kirkman, Joseph M. Stock, Bryce J. Muth and David G. Edwards (Kinesiology)

Purpose: The purpose of this study was to test the hypothesis that an acute dose of 12.6mmol dietary nitrate in the form of concentrated beetroot juice (BRJ) would improve exercise capacity and skeletal muscle mitochondria function in adults with moderate to severe chronic kidney disease (CKD).

Methods: 12 individuals with moderate to severe CKD participated in this study (61 ± 4 yrs; 9 males; eGFR $47.8 \text{ ml} \cdot \text{min}^{-1} \cdot 1.73 \text{ m}^2$). Participants were randomized to ingest 12.6mmol of BRJ or a nitrate-depleted placebo (PLA). Skeletal muscle mitochondrial oxidative function testing was performed using near infrared spectroscopy (NIRS) followed by a symptom limited graded exercise test on a cycle ergometer for determination of peak oxygen consumption (VO_2peak). Participants repeated the entire protocol in the other condition a minimum of 7 days later.

Results: We did not observe an improvement in mitochondrial oxidative capacity or VO_2peak in the BRJ condition.

Work performed and total exercise time was significantly increased after BRJ (Work: PLA 39.5 ± 9.9 vs BRJ 44.7 ± 10.7 kJ; Time:

PLA 627 ± 86 vs BRJ 674 ± 85 s; $p < 0.05$ for both). VO_2 at the ventilatory threshold (VT) was also significantly greater in the BRJ condition (PLA 0.79 ± 0.08 vs BRJ 0.95 ± 0.09 L/min; $p < 0.05$).

Conclusion: An acute dose of 12.6mmol dietary nitrate significantly improved VO_2 at VT, work performed, and total exercise time in adults with moderate to severe CKD

**EASEL #17: Kids first: A Pilot study of mindfulness and emotional wellbeing for preschool children
Christine Moriconi (Nursing and Center for Contemplative Studies)**

Why teach mindfulness to children? Teaching mindfulness to preschool children through direct and indirect experiences of mindfulness with their parents and teachers yields a systemic approach to learning emotional regulation which has been successful (Siegel, 2012). This pilot study (n=19) was a mixed method quasi-experimental, pre-post design. In the quasi-experimental group, parents and teachers were trained in mindfulness to indirectly teach children emotion regulation. Children learned mindfulness skills directly from parents. The population was a convenience sample of parents, teachers, and children at two local preschools. The intervention was 6 weekly sessions for 90 minutes. The control group did not receive the mindful parenting classes and will not receive the mindful teaching classes. Both control and quasi experimental groups received Second Step training, a social emotional learning program. Results are significant (p.05) for Describe and Observe factors of parents' mindfulness and decrease in hyperactivity for children. Qualitatively, most important parenting factor was use of mindfulness in daily interactions decreased stress of parenting. Implications for parenting programs through pre-schools.

**EASEL #18: The Effects of a Six-Week Weight Loss Program on Body Composition and Metabolic Rate
Anna Schade (Kinesiology)
Faculty Mentors: Selen Razon and Melissa Whidden**

Purpose: The purpose of this study was to determine if a weight loss driven program would also result in a decrease in body fat percentage, a decrease in waist and hip circumference, and improve resting metabolic rate (RMR).

Methods: Total weight (lbs), body fat (%), lean muscle mass (%), waist and hip circumferences (in) and RMR were assessed before and after the program in thirty four sedentary adults. Subjects were required to participate in a boot camp program a minimum of five days per week and follow a structured diet plan.

Results: There was a significant decrease in total body weight following the six-week challenge (197.1 ± 7.76 lbs pre vs. 187.8 ± 7.16 lbs post; $P < 0.001$). There was also a significant decrease in body fat ($38.6 \pm 1.52\%$ pre vs. $36.2 \pm 1.52\%$ post; $P < 0.001$) as lean muscle mass increased ($61.4 \pm 1.52\%$ pre vs. $63.8 \pm 1.52\%$ post; $P < 0.001$). Participants successfully lost 1 inch off their waist ($P < 0.01$) and hip ($P < 0.001$) circumference. Interestingly, RMR decreased from 1678.6 ± 59.36 kcal/day to 1602.7 ± 49.87 kcal/day although it was not statistically significant ($P = 0.09$).

Conclusions: These data suggest that this particular weight loss program is effective in significantly reducing total weight, body fat, waist and hip circumference as lean muscle mass increased. This study supports the effectiveness of a financially driven six-week weight loss program and emphasizes its positive impact on body composition in previously sedentary individuals.

EASEL #20: Human Bocavirus: An exploratory risk assessment

Chelsey Moore (Health)

Faculty Mentor: Neha Sunger

Human bocavirus (HBoV) was first identified in 2005 as pathogenic parvovirus, due to its presence in respiratory tract specimens from Swedish children with lower respiratory tract infections (RTIs). Currently, a causal relation between the presence of the virus and respiratory illnesses has not been established. However, increasing evidence in literature and epidemiological studies indicates a statistical association between HBoV and acute respiratory tract disease (citations). Herein, we aim to conduct an exploratory risk assessment for exposure to HBoV in young children using surrogate viruses (Adenovirus 4 and Coxsackie virus). A hypothetical scenario involving an adult day-care worker with active HBoV releasing infectious viral particles as aerolized droplets while tending to infants aged six-to twelve-months was evaluated. The infant's risk of contracting the virus was calculated using an Airborne Infection Risk Model and existing dose-response models for each surrogate. Stochastic exposure models were developed to capture the uncertainty in the risk assessment. The mean risk estimate based on the Coxsackie and Adenovirus 4 models were 0.18 and 0.96, respectively. Overall, the risk to infants in the facility was significant ($> 10^{-3}$), indicating the need to further evaluate the potency of this virus. Pathogen concentration in air (PFU/m³) appeared as the key driver of the risk assessment. As a result of this study, a benchmark framework presenting the quantitative risk assessment for HBoV infection in infants in a daycare setting was designed that can be potentially used as a template for analysis in future as more information becomes available on HBoV infectivity.

EASEL #22: Exploratory risk assessment for private wells and recreational water exposures to children in the State of New Jersey

Brandon Owen (Geology and Astronomy)

Faculty Mentor: Neha Sunger

In this study, we conducted a worst-case risk assessment for children from the ingestion of private well water in two densely populated counties of the Piedmont province in New Jersey - Hunterdon and Mercer counties. Additionally, an exploratory risk assessment was conducted to estimate the potential of health risk to children from common recreational activities in the Delaware River. Three exposure scenarios examined in this study were: 1) ingestion exposure to untreated groundwater from contaminated private wells, 2) recreational exposure through incidental ingestion of contaminated water from the Delaware River during swimming, boating, and fishing activities, and 3) ingestion exposure through fish consumption sourced from the Delaware River. The contaminants selected for analysis were Arsenic, Benzene, Trichloroethylene (TCE), Tetrachloroethylene (PCE), and the contaminant of emerging concern 2,2',3,3',4,4',5,5',6,6'-Decabromodiphenyl ether (BDE-209). As a result of this analysis, Arsenic and TCE in the source water were identified as key drivers of the health risk assessment and hence, are proposed as the contaminants of primary concern for the target population. Significantly high excess cancer risk of 2.28×10^{-3} was obtained for the scenarios evaluated, highlighting the need for testing and treating water sources as well as setting a framework for more detailed work in the future.

EASEL #29: Excessive Foot Mobility Enhances Static Stability under Visual Perturbation

Richard P. Bruno, David J. Stearne, Kenneth P. Clark, Molly Murphy, and Hyunsoo Kim (Kinesiology)

Faculty Mentor: David Stearne

Purpose: Excessive foot mobility may affect balance and stability, particularly under visual distortion. Since static instability may be associated with lower extremity injury and foot mobility may be associated with instability, the purpose was to investigate the influence of foot mobility differences and visual perturbation on center of pressure displacement, measured by sway path linear mean (SPLM) on a force plate.

Methods: We tested 58 recreationally active, healthy male and female college age subjects (age = 21.12 ± 1.21 years, height = 66.67 ± 3.33 in., weight = 152.43 ± 23.92 lbs.) in a cross-sectional design and compared static stability by foot mobility levels both unperturbed and then under visual perturbation. Independent variables were foot mobility, established by arch height index and navicular drop test, to define rigid or mobile foot type, and visual condition distorted with Fatal Vision goggles. Dependent variable was SPLM, established as average distance traveled between sample intervals collected over multiple 20 sec. one-legged static balance trials.

Results: Independent t-tests showed significantly lower SPLM in mobile foot group ($t = 2.05$, $p = .048$), compared to less mobile (rigid) foot type. However, between group differences emerged only in the visually distorted condition, where higher foot mobility was associated with greater stability. Interestingly, static stability was not statistically different between foot mobility levels in the visual (eyes open) condition during balance testing.

Conclusion: Since group differences occurred only in the visually perturbed condition, we infer that foot mobility appears to affect static stability when appreciation of visual field is diminished and subjects are left to rely on other substrates of postural control for balance.

EASEL #32: Pilot study for surface water discharge pattern in the Brandywine Creek watershed under different seasonal conditions

Connie Driedger (Geography and Planning)

Faculty Mentor: Neha Sunger

Understanding the variability in occurrences of contaminants of emerging concern (CECs) is important for developing monitoring and mitigation strategies across watersheds. Within Brandywine Creek watershed, common CEC sources include effluents from wastewater treatment plant (WWTP), concentrated animal feeding operations, and runoff from land applied biosolids. Since the potential for human health hazard from CECs and required measures to control the runoffs are largely unknown, additional information is needed to analyze how different land-cover types, season of the year (pre-harvest v/s post-harvest) and weather conditions (dry v/s heavy rainfall events) alter the concentration of CECs in the water systems. This study will seek to demonstrate the use of ArcGIS tool in assessment of seasonal and annual runoff in the Brandywine Creek watershed, to help provide a platform for further GIS analysis integrating land cover, socio-demography, CSO and stormwater discharges in the watershed. Three specific objectives of this study are – i) identify potential water sampling locations in the watershed to capture the loading burden in the creek from each of the potential sources of CECs in the watershed (sources include- agricultural runoff, WWTP runoff, runoffs from developed areas), ii) estimate surface runoff volumes at sampling locations with respect to the season of the year and, iii) assess association between land cover types and socio-demographic profile of the community with the stormwater discharges. This environmental GIS-based investigation evaluating linkages between land-use pattern and seasonal variations with CEC loading rates in a mixed-use watershed will improve predictability from site to site in future studies.

EASEL #33: Release and Transport of Phosphorus in the West Branch Brandywine Creek, Chester County, PA
Charles V. Shorten, Emily Condron, Jacob Brycki, Justice Lambon and Ashley Dellinger (Health)

Phosphorus is a key nutrient for plant growth but too much of it can trigger unwanted algal growth in waterways. The W. Branch Brandywine Creek in Chester County, PA is plagued by excessive P levels causing it to fail to meet in-stream water quality standards established by the Clean Water Act of 1972. Phosphorus tends to adhere to solid sediments but evidence suggests that it can be released back to aquatic systems following sediment re-suspension during storm events. This study examines P levels in W. Branch Brandywine Creek water during storms and release kinetics from associated sediments. Preliminary studies show that P levels peak during storm events. Leaching studies for a sediment sample obtained at the site of an old dam in Hibernia County Park (40.029446°N, 75.835647°W) show that P release follows a two-stage mechanism; fast release occurs over the first few hours of mixing with lab water followed by a slower release mechanism over the next several days. Modeling followed the relationship: Soluble [PO₄-P] = [C_{Fast}-C_{Fast} e^(-k_{Fast}*t)] + [C_{Slow}-C_{Slow} e^(-k_{Slow}*t)]; where C = maximal concentration of fast and slow releases, k = first order rate coefficients for fast and slow release and t = time; model fits showed C_{Fast} = 0.069 mg/L, k_{Fast} = 1.259 day⁻¹, C_{Slow} = 0.341 mg/L and k_{Slow} = 0.002 day⁻¹; R² = 0.951. These results help elucidate the mechanisms of phosphorus deposition and transport and can be used to plan for control and cleanup efforts.

EASEL #35: A Six-Week Boot Camp: Changes in Exercise-related Affects and Perceptions

Antonia Battaglino (Kinesiology)

Faculty Mentor: Melissa Whidden

Purpose: The purpose of this study was to 1) examine the effects of a six-week boot camp program on exercise-related affects and 2) identify motivations for program-adherence.

Methods: Twenty-seven sedentary individuals ($M=30.04$, $SD=10.33$) joined a six-week boot camp program to exercise at least five days per week, fifty minutes a day. At the onset and completion of the program, participants were administered surveys measuring their motivation for behavior change, self-efficacy for exercise and, perceptions of general health. Participants were also administered a single qualitative item scale at program completion for identifying motivations for program adherence.

Results: Paired sample t tests revealed a significant improvement in participants' mean scores for self-efficacy for exercise ($M=7.21 \pm 2.2$ pre vs. 8 ± 1.65 post; $t= -2.38$, $p < 0.05$) and overall perception of general health ($M=3.17 \pm 1.01$ pre vs. 3.92 ± 0.7 post; $t= -4.21$, $p < 0.05$). Qualitative analyses indicated three themes for program adherence: (1) systemic programing, (2) peer accountability and (3) the sense of community.

Conclusions: These results imply that alternative physical activity (PA) inventions can impact critical precursors of PA behaviors. Structured alternative programs that center around a supportive community while providing a sense of accountability may play a key role in facilitating long term PA behavior. Additional research is needed to further evaluate the potentials of these unconventional approaches to increase activity and decrease sedentariness.

EASEL #39: Validation of a Concussion Knowledge & Attitudes Survey Instrument in a Collegiate Population

Carrie Smith, Daniel J. Baer, Lindsey C. Keenan, and Nicole Cattano (Kinesiology and Sports Medicine)

Faculty Mentor: Daniel Baer

Purpose: Researchers often use Rosenbaum's Concussion Knowledge and Attitude Survey (RoCKAS) to assess knowledge and attitudes in athletes, which may influence concussion reporting behavior. However, this instrument has not been validated in college students. The purpose of this cross-sectional study was to validate the RoCKAS in a collegiate population.

Methods: We surveyed 280 WCU students, including athletic training students (ATS; $n = 48$), student-athletes ($n = 179$), and marching band (MB; $n = 53$). Only freshmen and senior students completed the survey. Following factor analysis of the RoCKAS Concussion Knowledge Index (CKI) and Concussion Attitudes Index (CAI), one-way ANOVAs compared CKI and CAI by group. Independent t-tests compared CKI and CAI between freshmen and seniors.

Results: CKI scores were highest in ATS, with no significant difference between athletes and MB. CKI was significantly higher in seniors versus freshmen in both ATS and athlete groups, but not in MB. Athletes scored lowest on CAI, with no significant differences between ATS and MB. Senior ATS scored significantly higher in CAI compared to freshmen, with no class differences in MB or athletes. Overall, CKI and CAI scores were significantly higher in senior ATS compared to senior MB and athletes, with no differences among freshmen groups.

Conclusions: This study provides validation for the RoCKAS for use in a collegiate population. ATS scored highest on both CKI and CAI. Significant differences among seniors, and no differences among freshmen, suggest that attitudes and knowledge change over time, especially among ATS as they learn about concussion management.

EASEL #41: Determination and occurrence of pharmaceuticals in Brandywine river samples by LC-MS/MS
Justice Lambon and Casey Anderson (Health and Chemistry)
Faculty Mentors: Neha Sunger and Pistos Constantinos

Growing presence of pharmaceuticals, classified as “contaminants of emerging concern” in our nation’s rivers, has resulted in public health concern among scientists in recent years. This study focuses on characterization of 3 pharmaceutical compounds in the Brandywine watershed using liquid chromatography tandem mass spectrometry (LC-MS/MS) method. Land use patterns along the Brandywine creek varies as the river cuts through rural/suburban communities in Chester County, PA to Christina River in Wilmington, Delaware. Due to variabilities in land use along the river, we sought to understand how its use correlates with the excessive chemical pollution emanating from human drug use and agricultural activities. Understanding the correlates would provide informed strategic decisions to control the pollution at source.

To achieve this, an MRM-LC-(QqQ)MS/MS method was developed and validated to determine the presence of codeine, fluoxetine and acetaminophen in river samples from 9 different locations: six sites along East Branch in Downingtown, PA, and three sites on West Branch (2- in Coatesville, PA and 1- in Wilmington PA). For efficient separation and ionization of low dose levels, different analytical columns, mobile phase composition and MS parameters were tested and optimized for their successful detection. Optimization of mobile phase, solid phase extraction and MS response was also performed to cope with different polarities. The method was validated and proved to be accurate, precise, selective and specific with satisfactory linearity within the calibration range.

EASEL #45: The Bilingual Advantage: A meta-analysis
Andrea Brandt (Communication Sciences and Disorders)
Faculty Mentor: Ana Rivera

A meta-analysis is a widely used research strategy consisting of asking a question, reviewing all previous studies, and synthesizing the information gathered. It is considered the best method of research in terms of evidence based practice in the medical field. The following meta-analysis explores the bilingual advantage in cognitive control tasks and the influence of inhibition on bilinguals. The bilingual advantage theorizes that bilinguals, who naturally experience inhibition on a daily basis by inhibiting one language while using the other, are better at nonlinguistic tasks that require inhibitory control. The cognitive control tasks examined in this study are: the Stroop, the Simon, and the Flanker tasks. This meta-analysis includes a literature review of publications within the past ten years that meet the criteria for review, utilizing the EBSCOhost search engine.

EASEL #46: Hip Strength Influences Ground Reaction Force Attenuation on a Side Leap in Collegiate Dancers
Michelle S. Sobel, David J. Stearne, Samantha Pederson and Kenneth P. Clark (Kinesiology-Exercise Science)
Faculty Mentor: David Stearne

Purpose: The majority of dance-related hip injuries are due to overuse, muscular compensation secondary to strength imbalances, and lower extremity misalignment. Fatigue-influenced altered landing mechanics may decrease force attenuation capacity so evaluation of jump landing strategies exhibited by dancers on a side leap maneuver might elucidate injury risk. The purpose was to examine ground reaction force attenuation differences pre and post fatigue potentially influenced by strength and alignment factors.

Methods: 16 healthy experienced female dancers from a university dance team participated in a cross-sectional design. Independent variables were strength and agonist-antagonist strength ratios for hip extensors, flexors, abductors, adductors, lateral and medial rotators, and knee extensors, q-angle, foot type and time. Dependent variables were peak vertical force, rate of loading, and anterolateral shear force composite.

Results: Independent t-test showed dancers with higher composite hip strength scores had significantly lower peak normalized vertical force ($p = .01$, $t = 2.16$) and vertical rate of loading ($p = .004$, $t = 2.16$) pre-fatigue on a side leap landing. No other group differences in strength, static Q-angle, foot mobility or fatigue were statistically significant.

Conclusion: Hip-strong dancers were better able to attenuate vertical force at ground contact pre-fatigue. Traditional analyses on dance-related impact landings have examined vertical components and associated alignment flaws. However, lateral type landings a side leap might redirect some of the landing force attenuation load from sagittal and vertical components to lateral shear force. Future research models should consider multi-directional forces imposed at ground contact during complex landing maneuvers.

EASEL #47: Medication Assisted Treatment for Opioid Abuse: A review of best practices for delivery **Harry D. Holt (Health)**

This study assesses the efficacy of Medication Assisted Treatment (MAT) as compared with other drug overdose treatment methodologies. The purpose of the study is provided clinicians and policy makers with support from the peer-reviewed literature to support increasing reimbursement and delivery of MAT services. There is a widely-held stigma against providing patients with MAT services, however, this review of the peer-reviewed literature shows that MAT services are superior to other detoxification techniques when assessed in the short-term and the long-term (greater than 90 days). The methods that were used in this study include performing key word searches of the extant peer-reviewed literature, searching the bibliography of select studies, and identifying the key areas in which MAT services are more effective. Searchers of the peer-reviewed literature were also conducted of the respective drugs that are part of the MAT service delivery. These drugs include vivitrol, suboxone, methadone and other medications. A review of the extant literature indicates that the combination of these drugs, along with significant amounts of clinical counseling, are significantly more effective than abstinence treatments for opioid abuse.

EASEL #48: The Readmission Difference: Examining the Negative Impact of Hospital Readmissions on Financial Performance **Harry D. Holt (Health)**

This study assesses the impact of hospital readmissions on the financial performance of hospitals. Understanding the determinants of hospital performance is one of the most important issues for managers of hospitals and policy makers. The study assesses the impact of readmissions due to infections and complications on financial performance. Financial and hospital readmission variables are captured with data from the Pennsylvania Health Care Cost Containment Council for years 2003 through 2009. Market and organizational variables are from the American Hospital Association Annual Survey Database. Hospital case-mix data is from Center for Medicare and Medicaid Services.

This study combines exploratory factor analysis and multiple regression with random effects and clustering. A risk adjusted composite score of hospital readmissions in a multiple regression model is used as the independent variable. Hospital readmissions were found to have a negative impact on operating margin in both the random effects model ($\beta = -0.788$, $p < 0.01$) and in the fixed effects model ($\beta = -0.576$, $p < 0.10$). The results of this study suggest unplanned readmissions from complications and infection have a strong negative impact on the financial performance of hospitals. Implications for management and policy are outlined.

EASEL #50: Comparison of BESS and LESS Scores in Participants With and Without History of Concussion and Lower Extremity Injury

Haley J. Anderson, Morganne J. Lundin, Marissa M. Breymeier, Katherine E. Morrison, Daniel J. Baer, and Nicole Cattano (Kinesiology and Sports Medicine)

Faculty Mentor: Nicole Cattano

Background: A positive association has been found between concussion and elevated risks of subsequent lower extremity injury yet it is uncertain what deficits are causing this. Further investigating the relationship between concussion and lower extremity injury could help enhance rehabilitation and decrease risk of subsequent injury.

Purpose: To compare the results of the Balance Error Scoring System (BESS) and a jump-landing task in participants with a history of concussion and lower extremity injury (Hx) and those without history of concussion or lower extremity injury (NoHx)

Methods: A cross-sectional study was used. Twenty participants reported to complete the BESS and a jump-landing task.

Results: Significant group differences were found between groups for BESS Tandem Stance Floor scores (Hx: 1.1 ± 1.0 , NoHx: 0.2 ± 0.7 ; $P = 0.045$). A significant moderate positive correlation ($r = 0.661$; $P = 0.002$) was found between BESS Single Leg Floor scores (1.35 ± 2.37) and BESS Tandem Stance Floor scores (0.7 ± 0.97). A significant moderate positive correlation was found in those with a history between BESS total errors on firm surface and BESS total errors on foam surface ($r = 0.454$; $P = 0.03$).

Conclusions: Those with a history of concussion and lower extremity injury had poorer balance scores (specifically in the tandem stance) than healthy controls. Ultimately, clinicians should assess athletes with a history of both concussion and lower extremity injury during pre-participation evaluations to discover poor performing athletes. Those who may be at risk could benefit from targeted preventative exercises.

EASEL #52: Relationship between Carotenoid-Rich Diets and Age-Related Macular Degeneration (AMD)

Prevention: A Systematic Review

Amanda Tome (Nutrition)

Faculty Mentor: Dr. Alessandra Sarcona

Objective: To determine the effect of a diet rich in carotenoids in the prevention of age-related macular degeneration (AMD) among adults.

Methods: Scholarly, English language studies, published between May 2010 and June 2017, were identified via MEDLINE, CINAHL, and PubMed electronic databases. Randomized control trials or observational studies investigating the effect of carotenoids from diet on the development of AMD among adults were included. Included studies were critically evaluated using the Quality Criteria Checklist.

Results: Seven observational studies met the inclusion criteria and were included in this review. All studies received a neutral rating and one was rated positive. Of the five studies that investigated lutein and zeaxanthin, three found a reduced risk of late or combined AMD among subjects with the highest dietary intake and two only found a reduced risk among participants with genetic susceptibility. Higher intake of lutein and zeaxanthin was associated with a reduced risk of early AMD among CFH genotype carriers. All three studies that examined β -carotene found a reduced risk of late or combined AMD. Only observational studies met the inclusion criteria, so a causal relationship cannot be ascertained.

Conclusion: A carotenoid-rich diet may be associated with a reduced risk of AMD, particularly late AMD among a general adult population, and early AMD among adult CFH genotype carriers. More research and higher quality studies are needed to definitively establish this association and to ascertain the amount of carotenoids needed to prevent AMD.

ORAL PRESENTATION ABSTRACTS

Presentation #18: “Carrying someone in your tummy is kinda hectic”: Conceptualizations of Pregnancy and Planning for Pregnancy among Adolescent Girls and Young Women in Harare, Zimbabwe
Chiwoneso Tinago (Health)

Zimbabwe has one of the highest rates of maternal mortality, yet little is understood about adolescent girls and young women's perspectives on pregnancy or planning for pregnancy; important information to aid efforts to improve maternal health. The research study took an emic approach to understand and describe how adolescent girls and young women in Harare, Zimbabwe conceptualize pregnancy and planning for pregnancy and how these conceptualizations inform decisions about pregnancy and planning for pregnancy. Semi-structured, in-depth, qualitative interviews were conducted with adolescent girls and young women aged 14-24 years (N=48) in two low-income high-density communities in Harare. Data were analyzed thematically using NVivo 10 software. Conceptualizations of pregnancy focused on the social aspects of pregnancy. Pregnancy was conceptualized across 9 themes: carrying a child and oneself, growing a family, motherhood, the best time for pregnancy, pregnancy decision makers, who is responsible for the pregnancy, pregnancy burden, pregnancy dangers, and increase in social status with pregnancy. Participants expressed mixed views concerning the possibility of planning a pregnancy. Planning for pregnancy was conceptualized during the pre-pregnancy, pregnancy, and post-pregnancy phases, with planning beginning in early adolescence with a plan to avoid sexual activity to prevent pregnancy. Findings highlight the need to consider socio-cultural views concerning pregnancy and include social networks in maternal health efforts in Zimbabwe. More studies are needed to understand women's perspectives on pregnancy and what it means to “plan for pregnancy” to enhance the effectiveness of efforts to improve pregnancy outcomes and maternal and child health in Zimbabwe

Presentation #19: The Effects of Pedometers on Body Weight and Metabolic Factors in Patients with Prediabetes
James J. Pinola, Patricia Davidson, and Melissa A. Reed (Kinesiology)
Faculty Mentor: Melissa Reed

Sedentary behavior, increased total body weight, elevated blood glucose levels and hyperlipidemia increase the risk of prediabetes. Physical activity and weight loss are two strategies for reducing the prevalence of prediabetes and type II diabetes. However, there is little known about the role of pedometers with regards to a Diabetes Prevention Program (DPP)

Purpose: To determine if pedometer use could aid in the reduction of total body weight, cholesterol, and blood glucose levels as a part of the CDC's DPP.

Methods: Body weight, FBG and lipids were measured prior to the start of the DPP and 16 weeks following intervention. The pedometer group (PG) (n=9) received pedometers and the control group (CG) (n=8) did not. The PG was asked to wear a pedometer for sixteen weeks. A 2x2 ANOVA was performed to examine differences.

Results: The PG experienced significant ($p < 0.05$) weight loss from pre to post-test (186.2lbs + 9.7 to 180.7 + 8.9) while the control group did not (191.3lbs + 16.8l to 190.1 + 17.0). Interestingly, HDL significantly decreased from pre to post-test ($p > 0.05$) in the PD group (58.1mg/dL + 4.0 to 54.1mg/dL + 3.6) while the CG remained unchanged (50.9mg/dL + 5.1 to 50.5mg/dL + 4.8). There were no differences between any other variables.

Conclusion: It appears that the addition of pedometers into the DPP can contribute positively to weight loss. However, further research and a larger participation population is needed to elucidate the mechanisms that contribute to the changes in body weight and lipid profile.

Presentation #20: A Case Study Evaluating the Efficacy and Cost-Effectiveness of Two Acute Wound Management Strategies
Sean McCann (Sports Medicine)
Faculty Mentors: John Smith and Dan Baer

Purpose: Proper management of acute skin trauma creates an optimal healing environment and reduces complication risk. Due to the physical demands of sport, athlete wound care requires frequent dressing changes to maintain healing conditions. Expensive materials for best practice wound management may not be accessible to athletic trainers in all settings. While research and practice guidelines support using occlusive dressings, some clinicians may benefit from more cost-effective strategies due to budgetary restrictions. In this case study, we compare the efficacy and cost-effectiveness of two wound care strategies recommended by the National Athletic Trainers' Association (NATA).

Methods: Two collegiate football athletes suffered superficial skin abrasions on the anterior knee during the 2017 season. We managed one wound using recommended occlusive dressings, and managed the other with acceptable non-occlusive dressings. We applied NATA guidelines for recommended management and monitored athletes daily for wound healing. After healing occurred, we conducted a cost analysis of each method.

Results: Healing time between the two athletes was comparable. The total cost for occlusive management over 11 days was \$100.38 (\$16.73/dressing). The cost for non-occlusive management over 7 days was \$12.74 (\$0.91/dressing).

Conclusions: We observed no differences in healing between the two athletes in this case study, suggesting that the efficacy of appropriate non-occlusive wound management is comparable to recommended occlusive management. The cost of occlusive dressing is 10 times greater than acceptable non-occlusive dressing. Based on these findings, non-occlusive dressing may be appropriate to achieve wound healing in settings where expensive occlusive dressings are not available.

Presentation #21: Mindfulness Training Opportunities for Students in the Pennsylvania State System of Higher Education

Michelle Laurenzi (Health)

Faculty Mentor: Donald McCown

Mindfulness practices have been identified as evidence-based techniques that offer benefits of stress reduction and support of health and wellness, with specific application with students in higher education. In the Pennsylvania State System of Higher Education (PASSHE), many schools have begun to add mindfulness and contemplative practices into their curriculum and activities. The purpose of this study was to find out which PASSHE schools are making mindfulness practices available to their students and through what avenues they are reaching students, with the intention of understanding how the schools might support each other, and what might be done to expand mindfulness training opportunities for students across the state. Using telephone and email interviews, data was gathered on each PASSHE university, as well as Lincoln University, a state-related neighbor of West Chester University. Through snowball sampling and unstructured telephone interviews, it was found that twelve of the fifteen schools (80%) in PASSHE, as well as Lincoln, currently offer mindfulness training (or had plans in place to begin programs). Of those twelve schools, eight (66.7%) offer mindfulness through academic coursework, eleven (91.7%) offer mindfulness through wellness initiatives, and seven out of twelve (58.3%) use both avenues. A conference held at WCU in Spring 2017 brought representatives of the schools together for dialogue around common themes: funding, space, training of faculty, and buy-in from administration and students. The group has committed to an annual PASSHE Mindfulness Conference to continue dialogue and expansion of mindfulness offerings throughout the PASSHE system.

Presentation #22: Health Care Career Choice: Perspectives of nurses and nursing students

Michaela Killian and Rachel Joseph (Nursing)

Faculty Mentor: Rachel Joseph

Purpose: The purpose of the study is to explore why people choose nursing as a career.

Introduction OR Rationale: Nurses are the largest group of healthcare professionals and reports of nurse burnout abound in literature. Why then do people choose Nursing as a career? A study conducted in one academic institution in the U. S. in 2016 in one institution indicated that altruism was a major factor that draws people to Nursing. The current study explored perspectives of nurses beyond national, academic and geographic boundaries.

Methods: Researchers designed a survey utilizing Qualtrics software to self-report the factors that influence individuals to choose nursing as a career along with demographic data. The survey link was distributed through email and Facebook inviting participants to indicate their motivating factors. Researchers collected data and completed a preliminary analysis. Results and Practice Implications: Several factors influenced the 179 participants to choose nursing, the predominant factor being altruism followed by job opportunities, job security and career flexibility. Generational difference and other factors that influence the career choice can be analyzed.

Conclusions: Nurses have a variety of reasons for choosing the career. The sociopolitical and economic factors that drive people to choose a career must work in tandem with their intrinsic values. Exploring the barriers can help recruiters to facilitate a positive experience for the nurses which will enhance nurse satisfaction and retention.

Presentation #23: First Do No Harm: Medical Marijuana, A Gateway Drug??

Samantha Barnett, Alexandra Foust, Emily DiCesare, with Jack Veasy as moderator (Nursing)

Faculty Mentor: Rachel Joseph

Although medical marijuana (MM) has been found effective in the treatment of seizures, there is an ongoing debate on its use in children. According to the American Academy of Pediatrics, MM has a negative cognitive effect on pediatric brain, including physical and mental development. In addition, MM contains different forms of toxins (The National Institute on Drug Abuse, 2017) Smoking marijuana, similarly to smoking tobacco, is an irritant to the throat and lungs and can cause a heavy cough during use. Its toxic gases and particles that can damage the lungs. Vaporizers expose the lung to ammonia which can cause irritation and has shown to have negative effects on the central nervous system. Ingesting an edible form of MM, while doesn't directly release a toxin, leaves a chance for overdose due to the slow onset of its effects. Discussions abound to state that MM can be a 'gateway drug' to more potent habit forming drug and lead to related social problems. When MM is legal, the availability of this drug can lead to harder drugs. One in six teenagers who use Marijuana are reported to become addicts in two years warranting caution in any use of MM (Volkow, 2014). Due to the limited research on the side effects and long-term effects of MM on the developing brain, its use in pediatric population should not be made legal. Nurses should be patient and family educators and advocates and direct them to other resources for pain or seizure reduction.

Presentation #24: Medical Marijuana: Should it be Legal for Use in Children?

Brianna Rebiszv, Alex Siebecker, Hugh Doherty, with Jack Veasy as moderator (Nursing)

Faculty Mentor: Rachel Joseph

Marijuana, also known as cannabis, has been found to reduce pain in patients with cancer, spinal cord injury, or post-traumatic stress disorder. With the emergence of opioid epidemic the use of medical marijuana (MM) is much debated. The Food and Drug Administration (FDA) has not found enough evidence to approve it for regular medical use for concerns of safety and effectiveness.

The effect of MM in children is unclear, due to the potential impact on the developing brain. MM is found to effective in reducing the frequency of seizures in 68% of patients with resistant epilepsy (N=201; Goldstein, 2016). Goldstein also reports its value in children with autism spectrum disorder and psychiatric illnesses. If MM is valuable in controlling seizures, the impact on the quality of life of these children and their families. Some states made MM legal, while those in other states need to cross several barriers to obtain it for their children with seizures. Use of MM may give financial benefit to families as well.

Lack of evidence on the effectiveness and safety of MM exists. The scientific community should consider it a priority area of research to explore the benefits, so that the potential families will not be denied of its benefits. Research also will help FDA and policymakers to develop policies on safe prescription of MM. Until that time, nurses should examine the history of patients, particularly those diagnosed with seizures, and teach parents on safe storage and administration to prevent abuse.

Presentation #25: A Quantitative Risk Assessment for *Stachybotrys chartarum*

Paula Morgan (Health)

Faculty Mentor: Neha Sunger

The inhalation exposure to *Stachybotrys chartarum* (SC) has been playing a critical role in public health domain due to its ability to produce toxins (trichothecene and other mycotoxins), that are implicated in the cases of acute idiopathic pulmonary hemorrhages (AIPH) in infants. Despite multiple studies reporting an association of exposure to airborne mold with negative human health effects such as respiratory, immunological, and hematological diseases, there currently are no regulatory guidelines for quantifying the airborne exposure threat associated with SC spores/toxins in indoor

environments. The primary goal for this study was to use risk assessment framework as a mechanism to quantify the potential risk of death associated with known concentrations of *S. chartarum* spores and toxins in human infants. Additionally, an attempt was made to provide a benchmark dose level above which an adverse effect may occur in human infants. To this end, best-fit dose-response models were generated by using published animal studies, followed by stochastic risk assessment to predict the likelihood of death in infants from AIPH. By using 10% as the benchmark response level, permissible exposure limits were obtained as 413 SC-spores/m³ or 2.66 x 10⁻⁰⁴ mg-toxin/m³. The predicted risk of death in infants for acute 24-hour exposure to toxins ranged from 1.0 x 10⁻¹¹ to 3.0 x 10⁻⁰⁶. This study suggests that *S. chartarum* exposure via inhalation in residential conditions may pose a risk for AIPH resulting in mortality in human infants, but a conclusive epidemiological study is needed to validate risk estimates.

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