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RELATIONSHIP BETWEEN ERGONOMICS AND PERCEIVED BACK AND/OR NECK PAIN IN UNIVERSITY OF MARY STUDENTS

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Context: Our study is twofold: 1) to see if posture correlates to neck and/or back pain 2) to see if an implemented ergonomic intervention helps decrease neck and/or back pain in human subjects. Our rationale for the study is to try and decrease neck and/or back pain in University of Mary students. Our study question was formulated to see if there actually is a problem with poor ergonomics and neck/back pain, and if there is a problem then we want to see if our ergonomic intervention will help. Over the course of our four-week study we will give out overall wellness surveys (pre-study, mid-study, and post-study), McGill pain questionnaires at these same times, and postural self-evaluations that will be done Monday, Wednesday, and Friday.

Objective: Our overall objective is to see if there is a correlation between poor ergonomics and back and/or neck pain; as well as, to see if an ergonomic intervention will help decrease said neck and/or back pain.

Design: Our research design will consist of a cross-sectional study. There will be a control and experimental group, one receiving an ergonomic intervention and one that won’t.

Setting: Our study will be conducted in various classrooms around the University of Mary. We will not take into account the different chairs and tables in which the classrooms provide.

Patients or Other Participants: We will recruit participants both male and female. The participants must be above the age of 18 years old and have no recent (within the year) traumatic injuries or surgeries to the spine, head, or shoulders. The participants must have classes on Monday, Wednesday, and Friday to perform the postural self-evaluations.

Interventions: The major intervention that we will perform is the ergonomic intervention that we will give the experimental group. This intervention is based off of ergonomic recommendations set out by OSHA. Other independent variables will include: posture in the class.

Outcome Measures: The main outcome or dependent variable in the study is if there is pain present, this will be recorded through the McGill questionnaire.
**Results:** ANOVA statistical analysis will be used (pain value, overall wellness score, and age) as well as descriptive statistics (posture, and what kind of pain is present). The two groups will be compared and a p<.05 will be used to determine statistical significance.

**Conclusions:** If the findings are significant, then this ergonomic intervention could be utilized in other settings to improve neck and/or back pain. Not only will students potentially be benefitted, but all people who spend a great time sitting during their job.
EXPLORING THE EFFECTS OF CHRONIC MUSCULOSKELETAL PAIN ON ROLE COMPETENCY AND OCCUPATIONAL PERFORMANCE

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The purpose of this study was to explore the perception of role competency and occupational performance in individuals with chronic musculoskeletal pain. Semi-structured interviews were conducted with five individuals from the upper Midwest who reported experiencing chronic musculoskeletal pain for at least three years. The interviews were audio-recorded and then transcribed verbatim. Participants also completed the Pain Self-Efficacy Questionnaire to be used as supplemental data for the study. From the data, three themes and one subtheme emerged. These included: (a) participants identified difficulty overcoming challenges associated with chronic pain, which required them to continuously alter their lifestyle; (b) participants expressed a negative emotional response to the challenges associated with chronic pain, yet recognized the value of striving for emotional adjustment; and (c) participants identified pain as a limiting factor in fulfilling their roles and performing occupations, with one subtheme: participants identified feeling an obligation to perform daily occupations, despite pain, in order to fulfill their roles. Results of this study may assist occupational therapists in meeting the unique needs of individuals living with chronic pain by addressing emotional response, loss or roles, and occupational performance limitations encountered with this condition.
MANAGING CHRONIC PAIN WITH A STANDARDIZED PROTOCOL

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Chronic pain affects millions of people in the primary care setting. Primary care providers (PCPs) are often at the forefront of care for this patient population. PCPs differ in treatment options for chronic pain patients. Some PCPs feel confident if their ability to treat this patient population, while others are left feeling frustrated. The lack of standardization and best practice guidelines in the treatment of chronic pain adds to this frustration and lack of confidence felt by some PCPs.

This project implemented a chronic pain protocol embedded in the electronic medical record to aid in standardizing treatment for chronic pain. This project utilized a pre/post implementation design. Outcomes were measures with PCP-reported questionnaires and organizational reports.

The results of this project showed an increase in PCP confidence and self-efficacy while decreasing frustration levels with the use of a chronic pain protocol. Organizational reports showed a slight increase in the number of anxiety, depression and urine drug screens. Although a significant increase occurred in physical therapy referrals, no change happened in chronic pain therapy group referrals. Substance risk screening remained basically unchanged, with a slight decrease in use after implementation. A decrease in the total number of opioid prescriptions was also identified from the organizational reports.

Standardization with the utilization of a chronic pain protocol for the treatment of chronic pain can have a positive impact on PCP confidence, frustration and self-efficacy. However, more research is needed on this topic to encourage best practice guidelines and recommendations for the treatment of chronic pain.
THE EFFECTS OF EXERCISE ON IMMEDIATE AND 24-HOUR MEMORY

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**Purpose:** To determine if studying while exercising impacts memory retention immediately post and 24-hours post study session. The data collected will contribute to helping students study more efficiently for exams.

**Methods:** This study consisted of 20-25 year-old male and female subjects currently enrolled at the University of Mary. Subjects were randomly assigned to two different groups. One group studied French to English conversions while exercising on a treadmill at an intensity of 40-60% of their calculated heart rate max for 20 minutes. The other group was sedentary (seated) while studying the French to English conversions for 20 minutes. Once the 20 minute study session was over, the participants were given 5 minutes before they received the post, fill in the blank, test. After they received the post test, they were given 10 minutes to complete it. They received the same fill in the blank test 24 hours after their initial exam and were allotted 10 minutes to complete the exam. The same participants came back the following week and completed the same process. They were moved to the opposite group with a different exam and with the same procedures as before. Variables that were assessed during the study included hydration levels, amount of sleep the participants received the previous night, amount of stress (using The College Readjustment Rating Scale), and their caloric intake. Statistics: Paired T test and Regression Analysis.

**Results:** A paired-samples T test was calculated to compare the mean test scores and the mean exercising post-test score to the mean sedentary post-test score. The mean on the exercise post-test was 54.86 (SD=20.22), and the mean on the sedentary post-test was 54.13 (SD=20.8). No significant difference was found between exercising test score and sedentary test score (T(35)=0.296, p= >0.05). A paired-samples T test was calculated to compare the mean test scores and the mean 24 hour exercising post-test score to the mean 24 hour sedentary post-test score. The mean on the 24 hour exercise post-test was 50.78 (SD=19.92), and the mean on the 24 hour sedentary post-test was 50.22 (SD=21.32). No significant difference was found between exercising test score and sedentary test score (T(35)=0.248, p= >0.05). A linear regression analysis revealed that stress score, hydration, hours of sleep, and/or diet were not significant predictors of test scores.

**Conclusions:** This study found that studying while exercising did not significantly impact immediate post-test scores and 24 hour post-test scores. Hydration, stress, hours of sleep, and diet did not appear to have an impact as well.
DATING AMONG YOUNG ADULTS WITH AUTISM SPECTRUM DISORDER: PARENTS’ PERCEPTIONS

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The purpose of this phenomenological study was to discover parents’ perceptions of dating as an occupation among their young adult children with ASD. Currently there is limited research on dating patterns in this population and parents’ perceptions of dating as it relates to their child with ASD. Five mothers of young adults diagnosed with ASD participated in this study. None of the young adult children were currently dating, though one had dated in the past. Data was collected using semi-structured interviews and field notes. The interviews and field notes were transcribed verbatim and coded to develop categories and themes. Four themes emerged from the data: (a) external factors influenced the adult child’s propensity to date in the past, present, and future; (b) internal factors influenced the adult child’s propensity to date and the quality of their relationships; (c) the parent’s role in influencing their adult child’s propensity to date was expansive and multifaceted; and (d) parents balanced feelings of concerns and hope for their child’s dating future. Results indicate parents feel a sense of uncertainty as they balance feelings of hope and concern, which informs their role as they structure their child’s environment. Interpersonal and environmental factors, which may hinder dating in this population, can be addressed by occupational therapists, with input from the young adult and parent.
TELE-CONTINENCE CARE

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It is well understood that incontinence is a common occurrence for women (Cardozo & Staskin, 2006; Gorina, Schappert, Bercovitz, Elgaddal, & Kramarrow, 2014). A variety of treatment options and recommendations exist for women seeking continence care (Appell et al., 2009); in general, patients residing in rural areas have decreased access to these treatments (IOM, 2001). Several authors have found telehealth to be a favorable opportunity for an assortment of healthcare specialties in need of access facilitation (Chen et al., 2013; Davis et al., 2010; Shah et al., 2013). Despite the sensitive nature of continence, Viers et al. (2015) found that even urology patients were willing to explore telehealth applications. In line with a Doctorate of Nursing Practice (DNP) capstone project, telehealth implementation and education efforts were made in order to improve care, specifically for continence care in a rural community. Healthcare team and physician stakeholder support were critical for successful implementation and sustainability. In this report, we will acknowledge (a) rates of continence care follow-up improving from 55% at baseline to 86% with telehealth implementation; (b) improved incontinence severity effectively assessed through telehealth; (c) patient satisfaction; and (d) healthcare team approval. The goal of this paper is to contribute to future telehealth recommendations and to operationalize telehealth within continence care; hence, the DNP Tele-Continence Care project.
EFFECT OF INTENSE AQUATIC CORE STABILITY EXERCISE ON BALANCE IN AN OLDER POPULATION

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Study Design: Before-after trial design.

Objective: To determine the effect of specific aquatic core exercises on balance in the elderly population when compared to an aquatic exercise program without specific core exercises.

Background: Numerous studies have shown the effectiveness of aquatic exercise on balance in older adults. However, previous studies have not determined a correlation between core training in an aquatic environment and improved balance when compared to a control group without core training.

Methods and Measures: For 6 weeks, two experimental group subjects participated in an aquatic exercise class with the addition of a set core exercises while two control group subjects participated in an aquatic exercise class without additional core exercises. Pre and post measures of Mini-BESTest and Functional Reach Test (FRT) were compared among groups.

Results: Due to small sample size, we were unable to compute significance values using a ONE WAY ANOVA. Although when comparing the current study’s experimental group’s results to the original study completed by Bodensteiner et al, the results continue to show positive correlation of aquatic core exercises and an improvement in balance.

Conclusions: This study did not find that the incorporation of core exercises into aquatic exercise programs to be statistically significant in improving balance versus aquatic exercise without core emphasis, however the addition of core has demonstrated significance in previous studies. This study was limited by the number of participants. Further investigation should be conducted with larger sample sizes.

Key Words: Mini-BESTest, Functional Reach Test (FRT)
A SUGGESTED PROTOCOL FOR AN ALL OUT ANAEROBIC PERFORMANCE TESTING OF WRESTLERS AND ITS COMPARISON TO THE RESULTS OF THE WINGATE ANAEROBIC TEST

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Background: The UMWAPT protocol simulates the anaerobic requirements of a full wrestling match, providing a way to measure the wrestler’s ability to complete an entire match against his most challenging opponent.

Purpose: The purpose of the study was to compare and correlate the mechanical outcomes and fatigue index between the Wingate Anaerobic Test (WAnT) and the University of Mary Wrestling Anaerobic Performance Test (UMWAPT).

Methods: 15 Subjects underwent both protocols in random order. Peak power, mean power, body weight relative peak power, body weight relative mean power, anaerobic capacity and fatigue index were calculated and compared between the protocols and within the UMWAPT test. SPSS 23 was used to analyze the results utilizing a two way ANOVA with repeated measures.

Results: A distinctive pattern evolved as the first session of the sled test produced better mechanical outcomes in comparison to the WAnT, yet the 3 other sessions produced inferior mechanical outcomes in comparison between protocols. Peak power correlations between protocols were weak to moderate, and weak to strong within the UMWAPT test. Mean power correlations between protocols were weak, and weak to strong within the UMWAPT test. Anaerobic capacity correlations between protocols were weak, and weak to strong within the UMWAPT test. Fatigue index correlations between protocols were weak, and weak to strong within the UMWAPT test. Body weight relative peak power correlations between protocols were weak, and weak to very strong within the UMWAPT test. Body weight relative mean power correlations between protocols were weak, and weak to very strong within the UMWAPT test. All participants indicated the UMWAPT as a very accurate simulation of their most challenging wrestling match.

Conclusions: The UMWAPT seems to be a good protocol to simulate a wrestler’s most challenging match. The UMWAPT allowed the wrestlers to utilize their own technique, leading to better mechanical outcome in comparison between the WAnT and the first session of the UMWAPT. While further research is needed with a greater sample size, it seems that this study gives hope that a wrestling specific all out performance protocol would be utilized, rather than a non-specific protocol such as the WAnT.

Key words: Anaerobic performances, peak power, mean power, anaerobic capacity, fatigue index, BW relative mean power, Wingate Anaerobic Test, University of Mary Wrestling Anaerobic Performance Test
Vertical jump is one of the most common activities utilized for assessment of lower body power. Various methods such as video analysis, force plates, contact mats, and highest touch technology, like the Vertec are commonly used to assess vertical jump. The accepted “gold standard” of measuring vertical jump height is video capture. Unfortunately, this method may not be practical in certain settings. Vertical jump assessment is often performed in settings with limited time or resources. Current research suggests that there are valid alternative assessment strategies for measuring vertical jump height. Multiple studies claim that both force plates and contact mats are valid assessment strategies. These methods typically calculate jump height based on flight time. Although this method has been proven to be valid, some studies caution against the flight time method. Vertical jump height calculated by flight time can be overestimated due to the fact that the center of mass is often different during take-off and landing. Some studies suggest that vertical jump height may be more accurately calculated by using the athlete’s take-off velocity. Research suggests that contact mats and force plates estimating vertical flight height by flight time and take-off velocity are valid vertical jump assessment methods.
REFOCUSING THE LENS ON LIFE: THE IMPACT OF CANCER

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Symptoms and side effects from cancer and/or its treatment vary greatly among individuals and can impact all occupations of life. The purpose of this study was to explore the lived experiences of individuals undergoing cancer treatment in central North Dakota in order to increase knowledge and understanding about cancer to assist healthcare professionals, families, and friends. A qualitative phenomenological study was completed using semi-structured, face-to-face interviews with six individuals diagnosed with cancer in the last 5 to 12 years. Participants were 55 to 90 years old from a community in central North Dakota. Data was transcribed verbatim before being coded and categorized. Themes then developed from these categories and were described using participant statements to emphasize common experiences of the participants. Four themes emerged on the lived experiences of individuals with cancer: (a) Participants identified changes in relationships as a result of being diagnosed with cancer; (b) Participants expressed how cancer and the side effects impacted their roles and routines; (c) Participants identified various coping mechanisms to manage the diagnosis of cancer as well as the side effects which coincide with treatment; and (d) Participants identified how a positive outcome was influenced by the importance of having a positive relationship with care providers. Although the symptoms and side effects varied among participants, many experienced similar patterns of change in relationships, roles, and routines. Participants also expressed a preference for a simpler life, rather than trying to return to all of their previous activities and roles.
NURSE EDUCATORS’ PERCEPTIONS OF WHICH PEDAGOGY PROMOTES CRITICAL THINKING

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The purpose of this study was to explore the perceptions of nurse educators on which pedagogies promote critical thinking. The sample consisted of seven nurse educators who teach in a baccalaureate program and had at least three years of experience as a nurse educator. Based on a phenomenological design, this study utilized semi-structured interviews to explore perceptions of which pedagogies promote critical thinking. Three categories identified from the interview data included: Pedagogy “One size does not fit all,” Critical Thinking “Students need building blocks,” and Novice to Advanced Beginner “Variety is necessary to meet different styles and stages.” The nurse educators that participated in the study established that one specific pedagogy does not fit all, that nursing students need building blocks as they learn to think critically, and that a variety of pedagogies need to be utilized in order to promote critical thinking. It is recommended that continued research be done to understand the difference between nurse educator’s perspectives on which pedagogy promotes critical thinking in nursing students in order for them to be deemed critical thinkers in the workplace.
THE EFFECTIVENESS OF CRANIAL ORTHOTICS ON HEAD SHAPE IN CHILDREN WITH PLAGIOCEPHALY: A PRELIMINARY UPDATE

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Study Design: Pre-test: Post-test single group design.

Objective: To evaluate how the use of cranial orthotic helmets for children with plagiocephaly will improve head shape and to identify the optimal age for the initiation of treatment.

Background: Current evidence related to use of cranial orthotics has been controversial; however, new techniques for fabrication have been developed, but not investigated. This investigation seeks to evaluate effectiveness of helmet use with updated technology, the Omega Tracer system, for scanning of childrens’ heads.

Methods and Measures: Review of 41 medical records of children, aged 4-12 months at initiation of treatment, whose parents elected to use cranial orthotics to treat plagiocephaly was completed. Data extracted and analyzed included to pre- and post-treatment measurements for head circumference, cephalic ratio, and cranial vault asymmetry index (CVAI).

Results: Results are pending.

Conclusions: Conclusions are pending.

Key words: cranial orthotic, plagiocephaly
N’ TERMINAL PRO BRAIN NATRIURETIC PEPTIDE (NT-PRO BNP) RESPONSE TO ANAEROBIC STRESS IN FOOTBALL PLAYERS AND WRESTLERS VS UNTRAIN ED INDIVIDUALS

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Background: The WAnT is a maximal anaerobic performance test conducted on a cycle ergometer against 8% of body weight and has a very high validity and correlation to peak anaerobic power and performance. NTproBNP is a plasma biomarker often used to indicate physiological and cardiac stress.

Purpose: To investigate the influence of the WAnT on blood pressure, lactate, and NTproBNP in trained Wrestlers and untrained young males.

Methods: 20 males, ages 18-25 underwent the Wingate Anaerobic Test. Subjects were divided into two groups. Group one included 10 untrained individuals (n=10), and group two included 10 wrestlers (n=10). Serum NTproBNP (pg/mL), lactate (mmol/L), and blood pressure (mmHg) were measured at rest, immediate post, two minutes post, and ten minutes post. Peak power (Watts), mean power (Watts), relative mean power (Watts·kg⁻¹), and fatigue index (%) were calculated for each subject. NTproBNP was analyzed utilizing ELIZA. Data was analyzed using a two way ANOVA with repeated measures via SPSS 23.0.

Results: The wrestler’s resting NTproBNP (pg/dL) levels were higher (35.5±7.59 vs 35.15±4.82 accordingly), with non-significant differences between the groups. Immediate Post NTproBNP was higher for wrestlers (40.25±14.08 vs 37.33±9.94 pg/dL) with a positive and strong correlation between PP and IP NTproBNP (r = 0.85). While the untrained had a substantially higher post 10 NTproBNP (45.07±11.75 vs 32 ± 5.57 pg/dL), both group’s NTproBNP was elevated post 10 minutes with a significant difference from post 2 minutes values (p=0.035). PP was significantly higher for the wrestlers (1031.6±188.65 vs 960.91±189.01 Watts). No significant differences were found between groups for body weight relative PP and MP.

Conclusions: NTproBNP (pg/dL) values were within the ranges reported in the literature with the exception of resting values being elevated likely due to nervousness, indicating that the WAnT did not put any of the subjects at risk due to cardiac stress. The recovery dynamics regarding NTproBNP were different between groups. Wrestlers recovered rapidly with a slight elevation 10 minutes post-test, while the untrained recovered slowly with a significant elevation of NTproBNP 10 minutes post-test.
THE EFFECT OF THE MENSTRUAL CYCLE ON PROPRIOCEPTION IN COLLEGIATE FEMALE BASKETBALL PLAYERS: A PILOT STUDY

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Context: Anterior cruciate ligament (ACL) tears are four to six times more in females to males, one cause of this could be because of hormonal changes. Proprioception training decreases ACL tears. The purpose of our study is to proprioception changes throughout the changes in menstrual cycle.

Objective: Does proprioception change throughout the menstrual cycle in the three phases of the menstrual cycle? Our hypothesis that the most significant decrease of proprioception will be noted in the follicular phase.

Design: The design of our study is a cohort pilot study. The cohort is collegiate female basketball players. This is a pilot study due to the small population size and it being new research.

Setting: The study will be conducted at the University of Mary and Bismarck State College.

Patients or other Participants: The participants will be recruited from the University of Mary and Bismarck State College women’s basketball teams. Excluded from the study will be those who have torn their ACL; have chronic lower extremities injuries and/or instabilities; those who are taking prescription medications; or individuals who have irregular or sporadic cycles.

Interventions: The female cycles will be based on an average 28 day cycle the phases are the follicular phase is day 1-9, ovulatory phase is day 10-14, and the luteal phase is 15-28. This testing will be done on days 1, 4, 8, 10, 14, 18, 20, 24, and 28 for the duration of one cycle. Proprioception will be measured using the Balance Error Score System.

Main outcome measure: The primary variables of this study are proprioception on certain days on the cycle.

Results: The data will be presented using a repeated measure analysis of variance (ANOVA). The proprioceptive errors will be statistically compared to the specific day and the stage of the cycle that the individual is in. Statistical significance will be found utilizing $P \leq 0.05$. This data will support or invalidate our hypothesis which is that the most significant decrease of proprioception will be noted in the follicular phase. The data shows statistical significance for the proprioception in the second phase, in both participants.

Conclusion: We conclude that proprioception does change throughout the menstrual cycle, primarily decreasing from the follicular to ovulatory phase. Due to our small affect size further research is needed for this topic. This knowledge shows that proprioceptive training in female athletes, could decrease the incidence of ACL tears caused my hormone changes.
TRANSITIONING TO COLLEGE: PERSPECTIVES FROM STUDENTS WITH MILITARY EXPERIENCE

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The transition from military life to academia can be a challenge for many student veterans. This phenomenological qualitative study intended to examine the factors that facilitate and hinder academic success for student veterans. Participants were selected through convenience sampling, snowball sampling, and word-of-mouth. Data were collected using semi-structured interviews and field notes. Five themes emerged: (a) The overall experience of transitioning to academia varied greatly among the participants; however, fear and anxiety were common reactions; (b) The participants identified using various resources during their academic experience, including tuition assistance through the military and tutoring, however accessing these resources were challenging at times; (c) Challenges experienced by the participants during the transition to higher education included feeling different than their non-military peers, managing multiple commitments and obligations, and social integration; (d) The participants identified several factors which contributed to their success including personal drive and motivation, general skills learned while in the military, effective time management, and support from their family and friends; (e) Staff and faculty who were flexible and accommodating were acknowledged as key contributors to the participant's academic success. The results of this study may assist institutions of higher education in meeting the unique needs of the student veteran population.
IMPROVING THE DIAGNOSIS AND MANAGEMENT OF GENERALIZED ANXIETY DISORDER (GAD) THROUGH IMPLEMENTATION OF THE GAD-7

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Introduction: Anxiety disorders affect millions of American adults in any given year, causing feelings of fearfulness and uncertainty. Individuals suffering from anxiety often have difficulty controlling personal feelings, which may negatively affect relationships and daily activities. Anxiety can be divided into a variety of different disorders, including generalized anxiety disorder (GAD), obsessive-compulsive disorder (OCD), panic disorder, post-traumatic stress disorder (PTSD), and social phobia. In the clinic setting, diagnosing any type of anxiety disorder can be challenging and can present differently in every person. Often times, screening for anxiety symptoms and measuring the severity of symptoms is difficult due to the lack of utilizing evidence-based anxiety assessment tools to aid in patient care. The aim of the performance improvement project was to increase accuracy in diagnosing and monitoring treatment effectiveness through implementation of the GAD-7 anxiety tool in the assessment of patients with GAD-type symptoms that present in a primary care setting, as well as to evaluate the effectiveness of the intervention.

Methodology: The performance improvement project was the review and formative evaluation of the effectiveness in implementing the GAD-7 anxiety assessment tool in the diagnosis and management of patients with GAD. The project incorporated disease prevalence, nursing and change theories, evidence-based guidelines, and pre-project assessment of the provider use of and knowledge regarding the value of using anxiety assessment tools in the assessment, diagnosis, and ongoing evaluation of patients with GAD, compared to post-project assessment of the same areas at a primary care clinic between December 2015 and March 2016.

Conclusion: As a result of the performance improvement project, the providers at the primary care clinic utilized the GAD-7 anxiety assessment tool in the diagnosis and management of GAD patients 100% of the time. However, the providers noted prior to implementation that documentation of DSM-V criteria met for diagnostic relevance to GAD was stronger pre-project implementation as opposed to post-project implementation. The providers realized the main focus was on tool usage in general, as opposed to utilization of the GAD-7 tool to support diagnostic reasoning pertaining to DSM-V criteria for GAD diagnosis. The providers also verbalized increased satisfaction in their ability to accurately diagnose and monitor treatment effectiveness with regards to GAD due to utilization of the GAD-7 tool. The primary care clinic is continuing the project indefinitely, in an effort to continue providing high quality, evidence-based care to the patients served.

Keywords: GAD, generalized anxiety disorder care, primary care, anxiety assessment, adult anxiety care
STANDARDIZED RECOMMENDATIONS OF FULCRUM LENGTH AND FORCE FOR THE LELLI TEST

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Study Design: Case Report

Objective: The purpose of this study was to standardize testing parameters and give recommendations for the Lelli test. The parameters were established for the fulcrum length and examiner force.

Background: There is limited evidence about the Lelli test regarding the testing parameters and procedures.

Methods and Measures: The study included one patient, diagnosed with an ACL tear determined via MRI and arthroscopic surgical procedure. The clinician placed the center of the ERMI Knee Extensionater® II foam support pad exactly 3 inches below the medial joint line creating a fulcrum height of exactly 3 inches allowing the heel to make contact with the examination table. A blood pressure cuff was applied at the superior patellar pole and inflated to 200 mm Hg to generate a downward force of the quadriceps onto the thigh. This procedure was repeated four times with the fulcrum (foam support pad) placed at 1, 3, 5, and 7 inches below the medial joint line of each extremity.

Results: The results of this study determined that the fulcrum should be placed 3 inches below the medial joint line with 200 mm Hg to generate a positive test resulting in no heel lift off, indicating a torn ACL.

Conclusions: The results of this study suggest that the Lelli Test is an effective intervention to diagnose ACL tears based off of the parameters that were established. The results of this study should be looked at cautiously based on small sample size.

Keywords: ACL, ACL special tests, Lachman’s
A COMPARISON BETWEEN THE SUB-MAXIMAL BRUCE AND THE SUB-MAXIMAL NDKS UNIVERSITY OF MARY PROTOCOLS (ADULT MEN AND WOMEN)

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Background: The field of exercise testing and evaluation is constantly on the look for new valid protocols. Clinical exercise physiologists utilize sub-maximal protocol and maximal capacity estimation equations to diagnose clinical populations’ maximal capacity via sub-maximal effort.

Purpose: The purpose of this study was to compare between the sub-maximal Bruce protocol and the sub-maximal NDKS University of Mary protocol in adult men and women, in relation to their effects on Heart Rate (bpm), Blood Glucose (mmol/L), Blood Pressure (mmHg), Lactate (mmol/L), Rated Perceived Exertion (scale), Dyspnea (scale), and Angina (scale).

Methods: 20 individuals volunteered to take part in this study, both male (n=13) aged 22 ± 4 years of age and female (n=7) age 22 ± 4 years. Subjects performed both a sub-maximal Bruce and sub-maximal NDKS University of Mary protocol. Protocol was terminated at 85% of estimated HRmax according to (220-age). Heart Rate (bpm), Blood Glucose (mmol/L), Blood Pressure (mmHg), Lactate (mmol/L), Rated Perceived Exertion (scale), Dyspnea (scale), and Angina (scale) were measured at rest, during the test and as peak value (85% of age estimated HRmax). SPSS 23.0 was used to analyze data via a two way ANOVA with repeated measures.

Results: the NDKS protocol induced a significantly higher HRpeak in women in comparison to the Bruce protocol (167.29±1.98 vs 154.18±45.91 accordingly, p = 0.002). No significant differences were found for the men’s HRpeak between protocols (166.6±1.71 vs 166.85±1.46, p = 0.76). ΔSBP (from resting to peak) showed no significance differences regarding sex and protocol. ΔDBP showed no significance differences regarding sex and protocol. Peak lactate values for both sexes were higher during the NDKS protocol (0.5-0.91 mmol/L). Δlactate was found to be greater for the Bruce protocol regardless of sex. Glucose depletion was found to be greater during the NDKS protocol regardless of sex, and higher for men regardless of protocol. RPEpeak was found to be higher in men regardless of protocol, yet higher for women in the NDKS protocol, and lower for men in the NDKS protocol. The duration of the test was longer during the Bruce protocol regardless of sex. All subjects, regardless of sex, were able to finish both protocols.

Conclusions: The overall comparison between protocols as to their effects according to sex and upon the dependent variables shows that the Bruce protocol allowed subjects to reach 85% of age estimated HRmax slower, lower lactate peak values and lower glucose depletion as major
advantages. The NDKS protocol allowed lower Δlactate from rest to peak intensity. Both protocols affected SBP and DPB to a similar extent. Exertion was found to be perceived as greater during the NDKS amongst women and lower amongst men. Thus, the researchers’ prime conclusion was that each protocol bares both advantages and disadvantages, allowing the tester to choose a preferred protocol according to the variables most important to that researcher.
BENEFITS OF CORE EXERCISES ON CORE STRENGTH AND BALANCE IN WOMEN’S COLLEGIATE VOLLEYBALL PLAYERS

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Study Design: A Prospective Cohort Study

Objective: To determine if core exercise implementation programming would be beneficial in improving core strength and balance in collegiate women’s volleyball players.

Background: The purpose of this study was to determine if core exercise implementation programming would be beneficial in improving core strength and balance in collegiate women’s volleyball players during their season. The literature states that the effects of preventative strength programming implementations are positive in preventing injuries. The hypothesis was that with the implementation of a core strengthening exercise program into every volleyball practice, there would be improved core strength and balance. This is also found as evidence in the literature. This study investigated the effect of a core-strengthening program on collegiate women’s volleyball players during their off-season conditioning times in the Spring of 2016.

Methods and Materials: This study was a prospective cohort study using mixed methods and consisted of two groups. Group A was the control group and group B was the experimental group. Pre- and post-tests of both groups’ core strength and balance was completed for this study. The athlete’s core strength and balance was tested using the Single-Leg Stance Balance Test, the Double Straight Leg Lowering Test, the Sorensen Test, and the Modified Side Plank Test. Core strengthening exercise program was implemented during the experimental group’s practices for four weeks. Descriptive statistics were described as a result of this study and included age, height, weight, position of player, injuries, surgeries, and pre and post-test results of core strength and balance. Average means and standard deviations were described of the study’s variables. A Multivariate Analysis of Variance test (MANOVA) was used to test the hypothesis. Statistical significance was set at \( p \geq 0.05 \).

Results: Results of this study was that the implementation of a core strengthening program, into off-season workouts, improves core strength and balance scores in collegiate women’s volleyball players.

Conclusion: If collegiate women’s volleyball players had deficits of core strength or balance going into off-season workouts, their scores improved.

Key Words: core strength and injuries, balance and injuries, correlation of strength and balance AND injuries, upper extremity injuries in volleyball, lower extremity injuries in volleyball
INTERNATIONAL SERVICE LEARNING: A JOURNEY TOWARDS CULTURAL INTELLIGENCE

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International service learning (ISL) is an educational opportunity where students travel to a foreign country and participate in an organized service experience. When participating in ISL, students directly interact with and provide services for individuals from different cultures. ISL provides students the opportunity to increase their level of cultural intelligence, which contributes to their ability to provide culturally competent services. Cultural intelligence refers to an individual’s ability to function in culturally diverse situations. The purpose of this quantitative study was to compare cultural intelligence in occupational therapy (OT) students who have completed ISL with those who have not completed ISL. Researchers surveyed 59 OT students, 18 who completed an ISL experience in Peru or Guatemala, and 41 who did not complete an ISL experience. The Cultural Intelligence Scale (CQS) questionnaire was utilized to measure each participant’s perceived level of cultural intelligence. A Mann-Whitney U test was ran using the Statistical Package for the Social Sciences for Windows Version 23.0 in order to compare cultural intelligence between those who completed ISL with those who have not completed ISL. Overall, the data revealed statistically significant higher CQS scores from the participants who engaged in ISL experiences. This study supported that completing ISL increases a student’s cultural intelligence, which is required to provide culturally competent care as entry-level practitioners. Future research should be completed to further identify the effects ISL has on OT students and to measure potential cultural competency skills attained from completing ISL.
WHAT ARE THE PERCEPTIONS OF SENIOR MILLENNIAL BACCALAUREATE NURSING STUDENTS’ PERCEPTIONS REGARDING THE RETENTION OF KNOWLEDGE IN THE EXPERIENTIAL LEARNING ENVIRONMENT OF THE FLIPPED CLASSROOM?

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The purpose of this qualitative study is to determine the perceptions of millennial senior baccalaureate nursing students regarding their perceptions of their retention of knowledge in the experiential learning environment of the flipped classroom. The sample consisted of eight millennial senior baccalaureate senior nursing students who were born after 1982 and had experienced the flipped learning environment on ten separate occasions during their nursing education. This study utilized the qualitative research design of phenomenology. Semi-structured interviews were conducted to gain a better understanding of student perceptions regarding knowledge retention in the flipped classroom. The three main categories derived from the data included: Who is the Teacher When We are Expected to Prepare for Class, An Eclectic Learning Environment Where…Learning Does Take Place, and Finding A Balance. Students discussed what parts of the flipped learning environment they benefited from, as well as areas that were not beneficial. Initially not all of the students reflected positively on the flipped learning environment, however by the conclusion of the interviews all of the students acknowledged that this innovative teaching method was beneficial to their learning needs and should continue to be used in combination with lecture. Information from this research study will provide data for nurse educators to evaluate if the flipped classroom teaching method can be a useful tool for the education of current and future nursing students. It is important to continue research on innovative teaching methods in order to obtain knowledge regarding learning environments and the promotion of learning retention.
THE CORRELATION BETWEEN HIP MUSCULAR STRENGTH IN RUNNERS WHO
DEMONSTRATE HYPERPRONATION OF THE FOOT

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Study Design: Cross sectional correlation design with one single cohort measurement.

Objective: To determine the correlation between hip strength and foot hyperpronation in runners.

Background: Foot hyperpronation and hip weakness individually contribute to running injuries. Evidence is limited in exploring a correlation between these two factors in a population of runners.

Methods and Measures: 28 subjects, average age 25.29, were included voluntarily in this study; 8 males and 20 females. Subjects were healthy runners who met the inclusion criteria. Each participant's hip abduction, extension, and flexion strength was tested using a handheld dynamometer. Foot pronation was measured using a modified navicular drop test in double and single limb stance. Measurements were taken on a single occasion.

Results: The stepwise analysis determined that weight/height ratio was the best predictor for navicular drop in double stance for the right foot (r= 0.587, P= 0.001) and left foot (r= 0.651, P= 0.001). The stepwise analysis concluded that left hip flexion strength was the best predictor for navicular drop in single limb stance for the left foot (r= 0.434, P= 0.011).

Conclusion: Hip extension and abduction strength showed no significant correlation with navicular drop. In double limb stance the variable that correlated the most with navicular drop was weight/height ratio. Therapists should consider the correlation of weight/height ratio and its effect on navicular drop as it is related to potential risk for future injuries.

Key Words: hip flexion, hip abduction, hip extension, navicular drop
A HOME EXERCISE PROGRAM FOR ADULTS PARTICIPATING IN A SUPERVISED UNIVERSITY-BASED EXERCISE PROGRAM AND ITS EFFECT ON HEALTH OUTCOMES

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Purpose: The purpose of this study was to determine whether the addition of an individualized, year-round home exercise program leads to improvement in health and fitness outcomes for individuals already participating in a three-day per week supervised, referral-based, pro bono exercise program at the University of Mary.

Methods: Participants of the established Exercise Clinic underwent a routine initial, 12-week, and 24-week health and fitness assessment as part of the Clinic standard procedures. At the 12-week re-assessment, approved and willing Clinic participants were given the home exercise program and designated as the intervention group, receiving a year-round, individualized home exercise program. Health outcomes, reported physical activity, and participant satisfaction were analyzed at the initial, 12-week, and 24-week fitness assessments using SPSS 22.0 software.

Results: Study participants showed significant improvement from initial to 12-weeks in BMI (38.47 ± 7.89 kg/m\(^2\), 37.29 ± 7.99 kg/m\(^2\), respectively; P<.05), and weight (256.03 ± 79.83 lbs., 250.15 ± 78.64 lbs., respectively; P<.05) but no significant changes in body composition were found between 12 and 24 weeks. Reported physical activity increased from initial to 12-weeks and was maintained from 12 to 24 weeks with over 80% meeting the current physical activity guidelines. Exercise Clinic participants rated cost, supervision, professional advice, student interaction, and exercise facility as the top 5 reasons for satisfaction with the Clinic.

Conclusions: The supervised Exercise Clinic has been an effective way to increase physical activity and improve health outcomes in participants and its unique model has attributed to participant satisfaction. More research is needed to determine the impact of home exercise on health outcomes and Clinic satisfaction.
DOES THE ABSENCE OF THE PALMARIS LONGUS MUSCLE INCREASE THE CHANCE OF AN ULNAR COLLATERAL LIGAMENT RUPTURE IN COLLEGIATE BASEBALL ATHLETES?

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The palmaris longus muscle is part of the wrist flexor muscle group that is also thought to help prevent a valgus force of the elbow. The ulnar collateral ligament of the elbow is the main defense against a valgus force. When the ulnar collateral ligament is torn, the elbow no longer has an adequate amount of support against a valgus force. The main source of a reconstructive graft for the ulnar collateral ligament is the palmaris longus muscle tendon. The purpose of this study was to see if a correlation exists between the absence of the palmaris longus muscle and the occurrence of ulnar collateral ligament tears. Ten Certified Athletic Trainers were surveyed about their experiences in the Kansas Collegiate Athletic Conference with ulnar collateral ligament tears, specifically in baseball during the past five years. Data was collected and reviewed comparing the types of reconstructive grafts used during ulnar collateral ligament reconstruction surgery, as well as, if the palmaris longus muscle was present for use in surgery.
PREVALENCE OF BURNOUT IN OCCUPATIONAL THERAPY PRACTITIONERS IN THE UPPER MIDWEST

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Burnout is a phenomenon that is receiving renewed interest within the health care profession. Three components comprise burnout: emotional exhaustion, depersonalization, and reduced personal accomplishment. The Maslach Burnout Inventory Human Services Survey (MBI-HSS) is a commonly used instrument to measure these three aspects of burnout within the health care profession. Past research has revealed a moderate high level of emotional exhaustion and depersonalization within occupational therapists. The purpose of this quantitative study is to examine the correlation between an occupational therapy practitioner’s years of practice and their scores on the MBI-HSS. The MBI-HSS and a demographic survey asking years of practice and practice setting were utilized to collect data. There were a total of 38 occupational therapy practitioners from a variety of settings in the Upper Midwest. Moderate levels of burnout were found: 50% had moderate to high emotional exhaustion, 24.7% had moderate to high depersonalization, and 24.7% had low to moderate personal accomplishment. Burnout can negatively impact occupational therapy practitioners in a variety of settings thereby influencing quality of care. Therefore, burnout should be closely monitored to ensure strong client centered care quality.
THE E-CARD; A RURAL HEALTH QUALITY IMPROVEMENT PROJECT FOR CHILDREN WITH COMPLEX MEDICAL CONDITIONS

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There are an increasing number of children with medical complexities in community settings. These children are often referred to as medically fragile or technology assisted. Due to their chronic health conditions, they may require specialized equipment such as tracheostomy tubes, central venous lines, feeding tubes, etc. The presence of these conditions can make them more susceptible to medical emergencies which may require access to the Emergency Management System (EMS) on a regular basis.

The populations of rural children with special needs residing in Bemidji, MN are over two hundred miles away from a specialty care facility. In the event of an emergent or urgent situation, careful planning and preparation regarding emergency care can present an opportunity for improved quality of care. This finding has led to a project aimed at improving care of rural Minnesota (MN) children who have special health care needs through a pilot program. This program developed and implemented a standardized tool intended to improve communication between families of children who have special needs, pre-hospital providers and emergency room providers.

The results of this evidence based practice project noted improvements in adherence to recommended rural emergency planning as well as education regarding emergency planning and preparedness for rural children who have special healthcare needs. Standardization and utilization of an emergency preparedness plan provides patients, families and providers of care opportunities for improved management of emergency care through education and collaboration.

Although the project sample was small and duration of project limited, similar outcomes may be viable when implemented wider region. Further research will be imperative to more fully determine the outcomes standardized communication tools may have on this vulnerable population.
ANALYZING THE EFFECTS OF A PRE-PRACTICE WARMUP ON LOWER BODY INJURIES IN COLLEGIATE BASKETBALL ATHLETES

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The purpose of this study is to analyze the effects of a pre-practice warm up on lower body injuries in collegiate basketball athletes. This study will compare the number and severity of lower body injuries sustained over a basketball season in which a pre-practice warm up was implemented, versus a separate basketball season with no pre-practice warm up. The subjects in this study are male, college aged basketball athletes. This study is a retrospective study, comparing the number and severity of lower body injuries after two basketball seasons. The data collection process utilized the gathering of data on lower body injuries from the team’s athletic trainer. Because the information was collected from the athletic trainer, all of the athletes’ personal information was kept from the researcher. The study found that during the 2013-2014 season in which no pre-practice warm up was used, the men’s basketball team suffered 12 lower body injuries. When the pre-practice warm up was implemented in the 2014-2015 season, the men’s basketball team suffered five lower body injuries.
EFFECT OF LOAD CARRIAGE ON MAXIMAL OXYGEN UPTAKE AND HEMODYNAMIC RESPONSES DURING THE UNIVERSITY OF MARY NDKS VO2MAX TEST

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Purpose: The purpose of this study was to investigate the effect of load carriage on maximal oxygen uptake (VO$_{2\text{max}}$) and hemodynamic responses before, during and after the UMARY NDKS VO$_{2\text{max}}$ test.

Methods: Fifteen healthy and trained Michigan Tech male cadets, age 21.13± 0.83 years, underwent the UMARY NDKS VO$_{2\text{max}}$ test without any load and with a 20 kg (44lbs) load. Metabolic measurements were taken every 15 seconds which including heart rate (bpm), relative maximal oxygen uptake (ml/kg/min), respiratory exchange ratio (LCO$_2$/LO$_2$), and metabolic equivalent task were done with a Parvomedic system (True Max 2400, Parvo Medics, Sandy, UT, USA). In addition, pre and post blood pressure (mmHg) were taken.

Results: The cadets achieved a significantly higher RVO$_{2\text{max}}$ (mL/kg/min) without additional load when compared to with additional load (54.29 ±4.34 mL/kg/min vs 53.18 ±3.96 mL/kg/min accordingly, t(14) = 4.466, p = 0.001), and a longer test duration (minutes) without additional load (16:47:24 ± 1:37:13 minutes vs 13:17:08 ± 1:09:16 minutes accordingly, t(14) = 18.747, p = 0.000). Differences regarding RER (L/L) were found to be insignificantly lower without load (1.20 ±.04 vs 1.21 ± .04 accordingly, t(14) = -1.045, p = 0.314). Heart rate (bpm) was significantly higher without additional load in comparison to with additional load (195.47 ± 8.53 vs 190.63 ± 7.51 accordingly, t(14) = 4.44, p = 0.001). Maximal respiration rate (RR, bpm) without additional load was significantly lower than during testing with additional load (54.25±6.93 vs 58.08 ± 7.60 accordingly, t(14) = -.3.312, p = 0.005). Maximal tidal volume (VT, L) achieved during testing without additional load was significantly higher than during testing with additional load (3.16 ± 0.40 vs 2.93 ± 0.41 accordingly, t(14) = 3.67, p = 0.003). Maximal minute ventilation (VE, L/min) achieved during testing without additional load was insignificantly higher than during testing with additional load (158.52 ± 16.59 vs 158.44 ± 20.40 accordingly, t(14) = 0.03, p = 0.976). The post systolic blood pressure (mmHg) produced after testing without additional load was insignificantly lower than post testing with additional load (126 ± 7.63 vs 128.2 ± 5.93 accordingly, p = 0.073).

Conclusions: The results clearly show that additional loads during the NDKS protocol limited the subjects’ ability to reach maximal cardiorespiratory function. Projecting on to a combat situation, the cadets would be able to fight for shorter durations subjected to high levels of...
intensity and cardiorespiratory workload. It is the researcher’s belief that the elevated RR (bpm) would have a negative effect on the cadets’ ability to accurately shoot during mission.

**Key Words:** Relative maximal oxygen uptake ($RVO_{2\text{max}}$), load carriage, hemodynamic responses, NDKS maximal aerobic protocol
PERCEIVED WELLNESS AND JOB SATISFACTION OF ATHLETIC TRAINERS IN THE MID AMERICA ATHLETIC TRAINER ASSOCIATION DISTRICT 5 (MAATA/D5)

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Context: The field of Athletic Training is growing quickly across the mid-west. However, the question of how high the perceived wellness and job satisfaction rates are in athletic trainers in the Mid America Athletic Training Association (MAATA/D5) has not been determined.

Objective: Identify possible demographic factors in individuals with low Perceived Wellness Survey (PWS) and Job Satisfaction Survey (JSS) scores taken by Athletic Trainers in MAATA/D5 working in various settings. The specific athletic training settings studied included collegiate, secondary, clinical, and other.

Setting: Online survey study based through the use of Qualtrics.

Participants: 21 practicing athletic trainers in MAATA/D5. A total of one hundred and seventy-five surveys were distributed with twenty-five surveys being sent to each individual state.

Method: Each participant completed a PWS, JSS, along with answering demographic questions through a Qualtrics survey. The participants were divided into four subgroups based on their athletic training career setting. The researchers compared the results of the surveys by utilizing a descriptive statistical analyze. An ANOVA was used to analyze the data of the scores of the subgroups and compare the means of each of these groups to the scores on the PWS and JSS separately to clarify relationships. A p value of P ≤ .05 was utilized to analyze the statistical significance.

Results: There is a statistical significance in PWS and JSS on participants based on participant career setting. There was also statistical significance for PWS in age and income among the athletic trainers. There were no significant differences in JSS and PWS in participants based on genders.

Conclusions: Due to the low number of participants the study should be repeated to verify significant differences in PWS and JSS among the collegiate, secondary, clinical, and other athletic training career settings. There is a need for further research to determine significant differences in PWS and JSS scores among athletic trainers in various career settings.

Key Words: Perceived Wellness Survey, Job Satisfaction Survey, Athletic Trainer, and Mid America Athletic Training Association District 5
EFFECT OF A MULTIFAC torial FALL PREVENTION PROGRAM ON FEAR OF FALLING IN OLDER ADULTS

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**Background:** Among adults aged 65 years and older, many have a fear of falling (FOF) or experience falls. Falls can lead to frequent injuries interfering with mobility, activities of daily living (ADLs), instrumental activities of daily living (IADLs), and social participation, thus impacting quality of life (QOL). Occupational therapy plays an important role in addressing fall prevention, understanding primary causes of falls, and researching the most effective fall prevention methods for older adults.

**Objective:** The purpose of this study was to assess the effectiveness of a multifactorial fall prevention program on participants’ FOF during occupational engagement.

**Design:** Pretest-posttest design with anecdotal evidence

**Subjects:** 14 residents aged 65 years and older residing in a senior living community in South Central Montana. Participants were at risk for falling or were fearful of falling, and had no known cognitive impairments.

**Method:** Participants attended a 7-week multifactorial fall prevention program. Outcomes were measured pre- and post-intervention utilizing the Activities-Specific Balance Confidence (ABC) scale and the Falls Efficacy Scale-International (FES-I). Anecdotal evidence was collected after each session.

**Results:** Results of the ABC scale and FES-I were not statistically significant. However, anecdotal evidence indicated that participants experienced a decrease in their FOF and an increase in their balance confidence.

**Conclusion:** Results from this study support the effectiveness of a multifactorial fall prevention program in decreasing FOF and increasing balance confidence in residents while completing daily occupations. The study’s results indicate that a short multifactorial fall prevention program is effective in raising awareness of fall risks.
A HEALTHY NURSE IS THE BEST NURSE TO KEEP PATIENTS HEALTHY: BEDSIDE REGISTERED NURSES PERCEPTIONS OF PROFESSIONAL NURSE BURNOUT

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The purpose for this study was to obtain the personal perceptions of registered nurses who practiced at the bedside and had greater than five years of work experience, regarding contributing factors of professional burnout, as well as alleviating measures to prevent this phenomenon. The sample consisted of seven registered nurses who worked on a medical-surgical unit or on a long-term transitional care unit in a Midwestern healthcare facility. Based on a phenomenological design, this qualitative study utilized semi-structured interviews. Three categories identified from the interview data included: Professional Nurse Burnout...; Self-care Measures: Finding Pieces of Joy; and What Can Others Do? Despite identifying that professional nurse burnout was a reality in the work setting for bedside registered nurses, caused by a wide variety of factors, the nurses provided insight into self-care activities as well as gave recommendations for employers and educational settings to help prevent and alleviate professional nurse burnout. It is important to continue research in this area so that further knowledge can be gained to prevent and alleviate professional nurse burnout in nurses who practice at the bedside, so patient care and safety can be enhanced. Improvements in professional nurse burnout can increase nurse satisfaction and retention, and also improve the quality of patient care delivered. Improving nurse retention may have a compounding effect to help to alleviate the current and ongoing nursing shortage so that patients can receive safe, high-quality care by nurses who utilize healthy self-care practices.
DOES HYDRATION HELP ATHLETIC STATISTICS IN WOMEN’S COLLEGIATE BASKETBALL?

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This retrospective study compares game statistics of a collegiate women’s basketball team to investigate if hydration has an impact on game performance. Nine females between the ages of 20-22 participated in this study. During the 2015-2016 season the basketball program implemented having the participants drink 13-20 ounces of water four hours prior to competition, and 7-10 ounces of water 20-30 minutes prior to the start of the competition. Throughout the competition the participants drank a minimum of 7-10 ounces of water for every 60 minutes of activity (Fink & Mikesky, 2015). Fluid intake and game statistics were recorded for each competition throughout the 2015-2016 season by the basketball staff. The previous season (2014-2015) used no monitoring, or prescribed implementation of fluid intake. The game statistics from the two seasons were compared to determine if hydration has a positive correlation with the statistical outcomes of participants, as well as, the team.
DEVELOPMENT OF AN INCREMENTAL STEPPING PROTOCOL IN LOW AND MODERATE CHD RISK INDIVIDUALS

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**Purpose:** To develop a submaximal incremental step test (SIST) that is easier and more portable than current incremental VO2 tests without compromising the accuracy of current submaximal tests.

**Methods:** The subject population consisted of 18-40 year old students currently enrolled at the University of Mary/ faculty currently employed at the University of Mary. Subjects performed a maximal Bruce protocol treadmill test, followed by two SISTs. The tests were performed on separate days with 5-7 days of rest between tests. The SIST was developed utilizing a combination of the submaximal Bruce Protocol estimation criteria and the American College of Sports Medicine stepping equation. Statistics: The relationship between MBP and SIST was investigated using a Pearson product-moment correlation coefficient.

**Results:** A Pearson correlation coefficient was calculated for the relationship between participants’ SIST and MBP. There was a strong, positive correlation between the two variables ($r=.682$, $n=33$, $p>.001$). A Pearson correlation coefficient was calculated for the relationship between participants’ SIST1 and SIST2. There was a strong, positive correlation between the two variables ($r=.807$, $n=33$, $p>.001$).

**Conclusion:** The SIST had a strong correlation with measured VO2 max. The SIST showed evidence of reproducible results with consecutive assessments. The SIST can be used as a means to assess VO2 max with a similar degree of accuracy that other submaximal VO2 assessment protocols possess.
LOWER EXTREMITY INJURY PREVALENCE IN HIGH-SCHOOL FEMALE MULTI-SPORT ATHLETES AND SINGLE-SPORT ATHLETES

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**Study Design:** Retrospective Epidemiology Analysis

**Objective:** To determine whether the prevalence of lower extremity injury in high school female athletes is greater in single sport or multi-sport participants.

**Background:** More than half of all high school students participate in some form of athletics. The participation by girls in interscholastic sports in the United States alone has increased from 1.84 million during the 1988-1989 school year to 3 million high school athletes during the 2007-2008 school year. In a 2002 survey, girls comprised 44% of all organized sports team members of children aging from 6 to 17. This makes sports one of the most popular extracurricular activities among high school-aged youth. Although many benefits can be gained from involvement in interscholastic sports, the increased activity among girls may also present greater opportunities for musculoskeletal injury. Prospective studies of high school populations have reported higher injury rates among female athletes than male athletes in similar sports. Whether an individual is playing one sport all year round or switching between multiple, injuries are always a possibility.

**Methods and Measures:** This study was conducted by surveying high school female athletes who participate in sports. The survey consisted of a questionnaire pertained to which sports these athletes participated in during the 2014-2015 sports years, and inquired the number of injuries that they sustained during that season. Other data that was collected included specific injuries that occurred, during which sport, sports season in which they occurred, number of practices or games missed from injury, frequency of the specific injury, and the number of sports each individual athlete participated in. Analysis of the data was completed by using an independent t-test to compare the injury prevalence between the two groups. Statistical significance will be set at p ≤ .05.

**Results:** A total of 13 participants volunteered for the study, with only 1 being a single sport athlete. Due to the lack of sample size, our study proved to be statistically insignificant, but clinically important. The results showed that single sport athletes have a 79% risk of injury, compared to a 23% risk on multi-sport athletes. The single sport athlete had injuries of foot/toes, knee, and thigh, whereas the multi-sport athletes proved to have a higher prevalence of injuries to the foot/toes, ankle, thigh, and trunk/low back.
**Conclusion:** This study does not prove any statistical significance. The sample size is very small, and larger epidemiology studies of this topic need to be continued. However, the data of this study reflects the results of the previous literature stating that single sport athletes have a higher risk of injury compared to multi-sport athletes. A clinically important feature found in this study is that prevalence and risk of injury to athletes, who compete in multiple sports and were of this particular population, was higher than that has been seen in the literature.

**Key Words:** lower-extremity, female, single sport athlete, multi-sport athlete, high-school
A COMPARISON OF DEMOGRAPHICS AND SERVICES FOR AUTISM SPECTRUM DISORDERS BETWEEN 2010 AND 2015

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Autism spectrum disorder (ASD) is characterized by limited communication and social interaction skills. This disorder is becoming more prevalent in the United States. In 2010, one in 68 American children was diagnosed with ASD. As the awareness of ASD increases, more caregivers are seeking ASD evaluations for their children. This study aimed to identify trends in demographics and utilization of occupational therapy (OT) services for children diagnosed with ASD in south central Montana. This study utilized a convenience sample of children and caregivers from an ASD-diagnostic clinic in south central Montana to analyze both retrospective data from 2010 and prospective data from 2015. In 2010, 20% of children diagnosed with ASD had a family history of ASD. In 2015, that percentage increased to 60%. The number of children referred to the diagnostic clinic by a physician increased by 40%, from 2010 to 2015. The mean age of children diagnosed was 39.9 months in 2010 and was 48 months in 2015. The percentage of children receiving OT services before the ASD diagnosis was 42.9% and 85.7% after the ASD diagnosis in 2015. This study provides an overview of the demographic data and OT service utilization of children diagnosed with ASD in south central Montana.
HEART FAILURE READMISSIONS: FROM THE EYES OF A PATIENT

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The purpose of this study was to explore perceptions of patients, who have congestive heart failure and who had a recent admission to the acute care setting, regarding factors that influenced their readmission to the acute care setting, as well as to identify if there are areas of teaching that need to be increased in emphasis or added to patient education to decrease future readmissions. The sample consisted of seven patients who had a readmission to the research setting and had a diagnosis of acute congestive heart failure. This qualitative study utilized semi-structured patient interviews to identify new insights and patient perceptions. Three main categories identified from the data included: A Deficit in Continuity of Care; Resilience in the Face of a Chronic Debilitating Illness; and Heart Failure Knowledge and the Role of Education in Self-Care. Despite patient determination and strength of character, readmissions were experienced by all patients. These resulted as a lack of adherence to their heart failure self-care regimen, poor responsiveness of their bodies to heart failure management measures, and or poor healthcare provider continuity. Improvements in communication of healthcare providers could increase continuity of care for patients. A palliative care consult and increased education would also benefit these patients. It is important to continue this research, expanding it to other chronic illnesses such as, chronic renal failure, diabetes, and chronic obstructive pulmonary disease.
PHYSICAL LITERACY

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This study implemented a physical literacy program to determine if playing twenty minutes of literacy games could improve students’ scores on the winter reading Measurement of Academic Performance (MAP) test. The literacy program consisted of forty-five kinesthetic activities involving reading and vocab concepts over a twelve week period. Eighteen seventh grade students completed the program. At the end of the program students completed the MAP test. Students also completed MAP testing in sixth grade, but with no physical literacy program in place. A samples t-test was used to compare the students’ growth from the sixth grade MAP test scores to the growth scores from the students’ seventh grade MAP test scores. The students’ growth was found statistically significant (p<.05) both years with a mean growth of 5.78 in sixth grade and 5.56 in seventh grade. Expected grade level growth is only 2-4 points on the MAP test each year. There was no significant (p<.05) difference when comparing the 6th grade growth scores to the 7th grade growth scores.
ESTIMATING ONE’S VO2MAX DURING THE NDKS MAXIMAL AEROBIC EXERCISE TEST VIA THE RESULTS OF THE SUB-MAXIMAL NDKS AEROBIC EXERCISE TEST

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Background: Sub-maximal exercise tests are often used when patients cannot perform a maximal exercise test. In such cases, an estimation of maximal aerobic capacity is achieved via estimation formulas.

Purpose: The purpose of the study was to estimate one’s VO2max during the NDKS maximal aerobic exercise test via the results of the Sub-maximal NDKS aerobic exercise test.

Methods: 10 males and 10 females untrained and of low-moderate risk, aged 20.05 ± 2.21 years underwent both a maximal and sub-maximal NDKS aerobic exercise test with gas exchange analysis. Linear regression was used to estimate RVO2max via Sub-maximal RVO2.

Results: The women’s RVO2max (ml/kg/min) was lower in comparison to the men’s (46.3±7.73 vs 56.5±1.193, accordingly), as was their absolute VO2 (L/min) (3.09±0.75 vs 4.31±0.47, accordingly). Women’s HR rose from 88.2±16.52 at rest to 191.11±8.61 at maximal effort. Men’s HR rose from 70.5±18.36 at rest to 192.7±8.53 at maximal effort. Men’s SBP rose from 124.6±12.3 at rest to 143±12.53 at maximal effort. Women’s SBP rose from 118±8.55 to 130.78±12.51 at maximal effort. Men’s DBP decreased from 76.2±7.86 at rest to 72±9.38 at maximal effort. Women’s DBP rose from 74.8±8.55 at rest to 77.89±8.55 at maximal effort. Women’s resting lactate was lower at rest in comparison to that of men (1.69±0.77 vs 1.95±0.48 accordingly), as well as lactate at maximal effort (8.83±2.74 vs 12.87±1.95 accordingly). The RPE reported at maximal effort was higher for men in comparison to women (17.3±2.45 vs 16.25±2.25 accordingly). Maximal RER was slightly higher in women in comparison to men (1.09±0.99 vs 1.1±0.06 accordingly). The RVO2max prediction equation for the whole group (women and men) was found to be 1.019·VO2(HR85%) + 12.02, while the equations for women and men separately were 0.334·VO2(HR85%) + 33.623 and 1.019·VO2(HR85%) + 12.081 accordingly. The equation for the whole group was found to have the smallest estimation difference from the actual RVO2max with an average estimation error of 1.64±4 ml·kg⁻¹·min⁻¹ equal to 2.85±0.35 %.

Conclusions: The whole group RVO2max estimation equation was found to be the better equation to use in regards to the NDKS submaximal and maximal protocols. Further research and a greater sample is needed to better the accuracy of the estimation equation.

Key Words: VO2max, RVO2Max, maximal aerobic exercise Test; ramping protocol; sub-maximal aerobic exercise test; RVO2Max estimation equation; women; men
A COMPARISON OF PATELLAR TENDON AND HAMSTRING AUTOGRRAFTS IN ACL RECONSTRUCTION AND RETURN TO PLAY TIMEFRAME

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The purpose of this study is to determine which type of autograft used for anterior cruciate ligament (ACL) reconstruction will enable the patient to return to full participation faster. This study is a data collection which includes the following data: type of graft, date of surgery, and date of return to full participation. The most frequently utilized autografts are the patellar-tendon bone autograft and hamstring-gracilis autograft. Previous research indicates no significant differences between the two grafts with the return to full participation. The anticipated outcome of this data collection is that the hamstring-gracilis autograft will show a quicker return to participation because of the decreased harvest site symptoms. A total of eight subjects’ data was collected for this study; four who used patellar-tendon bone autograft and four who used hamstring-gracilis autograft. The results from this data collection will assist healthcare professionals in order to educate their patients thoroughly and effectively.
THE IMPACT OF EQUINE-ASSISTED ACTIVITIES ON SELF-CONFIDENCE, MOTIVATION, AND SELF-PERCEPTION OF YOUTH: A PILOT STUDY

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Overall, there is lack of evidence on the effectiveness of equine-assisted activities, particularly on youth. Using horses and other animals as a therapeutic media could be an advantage to healthcare professionals and clients due to the beneficial interactions seen between the individual and animal. The purpose of this pre- and post-test multiple case study design research was to determine the impact of equine-assisted activities on self-confidence, motivation, and self-perception of children and adolescents in the upper Midwest as measured by the Self Perception Profile for Children (SPPC) and Volitional Questionnaire (VQ). Study participants were 5 children and adolescents between the ages of 7-years and 20-years who participated in a 4-week equine-assisted activities program during the fall of 2015. No statistically significant differences were found on any of the subtests of either assessment, but the researchers noted slight positive changes in the raw data on four of the domains in the SPPC and five of the domains in the VQ. These domains included scholastic competence, athletic competence, behavioral conduct, and global self-worth for the SPPC as well as tries new things, indicates goals, shows pride, tries to solve problems, and seeks challenges for the VQ. This study may provide minimal support for occupational therapists (OTs) utilizing animal-assisted activities within their therapy sessions as a means of addressing perceived abilities, behavior, self-worth, and volition. However, additional research is needed.
ADDRESSING ANTIBIOTIC PRESCRIBING PRACTICES OF PRIMARY CARE PROVIDERS FOR PATIENTS WHO HAVE LONG TERM INDWELLING URINARY CATHETERS: AN EVIDENCED BASED PROJECT

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Introduction: Antibiotics are powerful medications which are generally considered both safe and useful in fighting infection. However, instances exist when these medications may be harmful. When a needless or inappropriate antibiotic is prescribed, antibiotic resistance may develop. The Centers for Disease Control and Prevention (2013) state that antimicrobial resistance is a significant health threat and resistance is on the rise. One specific group of individuals who are at a greater risk for antimicrobial resistance are individuals with chronic, indwelling urinary catheters (CDC, 2013). Healthcare providers and their patients have come to experience the emerging and significant changes regarding the bacterial spectrum and antimicrobial resistance patterns of catheter associated urinary tract infections (Wazait et al., 2003).

Methodology: This performance improvement project educated primary care providers on judicious antimicrobial practices for patients with long term indwelling urinary catheters. Additionally, an intervention was incorporated within the electronic health record to support the clinician in decision making based on the Infectious Disease Society of America’s recommendations.

Conclusion/Significance: Unfortunately as the Nobel-prize winner, Sir Alexander Fleming foreshadowed, unsuitable antibiotic usage is resulting in resistant bacteria (Rosenblatt-Farrel, 2009). Appropriate application and selection of antibiotics is critical to optimize treatment of infections and limit the spread of antibiotic resistance (CDC, 2014). Therefore, it is essential to support the practitioner in making judicious antimicrobial management choices in thwarting consequential sequela, especially in vulnerable patient populations such as those with chronic, indwelling urinary catheters.

Keywords: Antibiotic resistance, long term indwelling urinary catheter, prescribing practices
SCREENING FOR PTSD: THE PHYSICAL THERAPIST’S ROLE IN REDUCING PSYCHOPHYSIOLOGICAL BURDEN

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Study Design: Survey study

Objective: Examine the level of knowledge of PTSD by PTs, and their knowledge and appropriate use of screening tools for PTSD.

Background: There is a lack of insight as to the awareness and appropriate use of PTSD screening tools and the level of knowledge physical therapists have about PTSD.

Methods and Measures: An online questionnaire was sent via e-mail to University of Mary clinical affiliates with physical therapists practicing in U.S. acute inpatient hospitals, subacute rehab hospitals, skilled nursing facilities, outpatient clinics, schools, and home health environments; 109 responses were collected. The survey queried participants’ demographic information, depression and PTSD screening frequency, awareness of PTSD screening tools, appropriate use of screen results, rationale for not using such tools, and perceived level of knowledge about PTSD. A pilot study was conducted to pretest the construct validity of the questionnaire. Data was stored securely offline and evaluated using descriptive and inferential analyses.

Results: 102 of 109 respondents (93.6%) reported “never” (81.7%) or “very rarely” (11.9%) screening for PTSD, nor were they aware of any PTSD screening tools. 77% of respondents that do screen for PTSD reported not knowing when to refer patients to a mental health professional. 76.1% denied a PTSD component in their physical therapy education. A statistically significant positive correlation exists between having PTSD education and perceived level of knowledge of PTSD (p<0.05).

Conclusion: The results of this study suggest that physical therapists have limited knowledge of PTSD, PTSD screening tools, and the appropriate use of these tools.

Key Words: PC-PTSD, Breslau, Screening, Somatization, Dysregulation
A VARIATION OF A STANDARDIZED PARTIAL CURL-UP TEST
AND ITS EFFECT ON PERFORMANCE

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Background: According to the Standard Canadian Society of Exercise Physiology (SCSEP), individuals <45 yr are to complete the partial curl-up test at a reach distance of 12 cm.

Purpose: This study aimed to investigate the relationship of spinal flexibility, arm length, height, and torso length on execution of the SCSEP curl-up test, as factors not previously studied according to the knowledge of the researchers, and in addition to previously studied variables of age, waist circumference, plank time and reported physical activity. To the best of our knowledge, no study has assessed all of these variables at varying reach distances of 8, 10, and 12 cm.

Methods: Maximal plank time and anatomical assessments were recorded for 45 [age 22 (18-36)] subjects. Each subject completed a partial curl-up test following the SCSEP protocol as defined in the ACSM’s Guidelines for Exercise Testing and Prescription, Ninth Edition, at reach distances of 8, 10, and 12 cm in randomized order and 24-48 hours apart.

Results: A one-way MANOVA was calculated examining effect of height, weight, waist circumference, arm length, torso length, and spinal flexibility on repetitions completed during the 8, 10, and 12 cm curl-up test. No significant effect was found. Further, a simple linear regression was calculated to predict participants’ performance on the curl-up test at the varying reach distances based on the previously mentioned variables. A significant regression equation was found for arm length at both the 10 cm ($F(1, 43) = 5.674, p < .05$), with an $R^2$ of .117, and 12 cm ($F(1, 43) = 5.348, p < .05$), with an $R^2$ of .111, reach distances.

Conclusion: In subjects <45 yr spinal arm length appears to impact performance of the curl-up test at 10 and 12 cm. Further research, with a larger N number and a better distribution of variables, is needed to determine influence of flexibility, height, and torso length on performance of the curl-up test at any of the reach distances examined in this study.
A STUDY TO DETERMINE IF KNOWLEDGE OF AND ATTITUDE TOWARDS CONCUSSION CHANGES AFTER COORDINATED EDUCATIONAL PROGRAMMING

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Study Design: Cross Sectional Study

Objective: To determine if knowledge of and attitude toward concussions changes after a series of educational programs.

Background: “Educating youth, parents, and coaches about concussion may reduce student athletes’ risk for Second Impact Syndrome (SIS). Without proper education, student athletes may not report their symptoms to an adult or proper health care provider. In addition, parents and coaches lacking concussion knowledge may not allow accommodations or the proper time needed for the brain to recover.” (Manasse-Cohick, 2014)

Methods and Measures: Subjects were volunteers from the girls’ soccer team at Legacy High School, Century High School, and Bismarck High School. Each subject completed the ROCKAS-ST survey to assess their knowledge and attitude towards concussions prior to the education being presented. The subjects received three weeks of education concerning concussions and were then given the ROCKAS-ST again to see if the knowledge and attitude had improved in any way.

Results: At this time we have no results. Our study will be completed on April 22, 2016. Our expected results are that the ROCKAS-ST scores about knowledge of and attitude towards concussions will increase after the education component.

Conclusions: At this time we can draw no conclusions about our study. Our study will be completed on April 22, 2016, at which time we will be able to compare the results of the first ROCKAS-ST to the second one.

Key Words: concussion, education
THE JOURNEY OF ROLE ADJUSTMENTS DURING WIDOWHOOD

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The purpose of this study was to explore the role adjustment changes in the lived experiences of widows aged 35 years or older who lived in central North Dakota. Five participants between the ages of 40 and 73 years were chosen using a purposive sampling technique. Each participant participated in a semi-structured interview. Qualitative data was analyzed through coding, categorization, and identifying themes. Five themes emerged: (a) participants encountered various emotional responses relating to the loss of their spouses, (b) participants accepted new challenges, which were dependent on previous roles they assumed, (c) participants sought to find new meaning in their lives through personal achievements to overcome their own hardships, (d) participants utilized diverse internal and external outlets to cope with their own personal experiences, and (e) participants possessed an internal drive to proceed with life in order to move past their own emotions and to make life meaningful for themselves and others. The results of this research provided a greater understanding of role adjustments in widowhood. By reflecting on their experiences, participants discovered their own personal strength which allowed them to transition to new roles with increased confidence. This study suggests participants’ roles changed to allow adjustment to their individual needs in order to persevere. Understanding the role adjustment process is essential for occupational therapists and other healthcare disciplines to provide holistic care to their clients.
“I MEAN, I RESPECT THE OLDER ADULT. I LOVE THEM YOU KNOW BUT…” NURSING STUDENTS’ PERCEPTIONS OF THEIR LONG-TERM CARE CLINICAL

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The purposes of this study were to investigate perceptions of a group of Midwestern nursing students, who were ready to graduate, regarding long-term care clinical experiences and to determine the influence that these experiences may have had on their decision to choose this type of setting as a first career option. This research utilized a qualitative research methodology with an interpretive phenomenology research design. Ten students were selected using a purposive convenience sample. Semi-structured guided interviews were conducted. Analysis of the interview data resulted in the formation of three main categories that were: They Are Like Everybody Else; Reflections of Nursing in a Long-Term Care Facility, It’s Like Go, Go, Go; and Not for Me. The data analysis revealed that despite obtaining positive long-term care academic clinical experiences, none of the students would choose employment in a long-term care setting as their first choice of employment after graduation. In contrast, the students claimed that they would be open to work in a long-term care setting when they get older, had nursing experience, and/or were ready to retire. Suggestions were offered to promote a long-term care clinical experience for nursing students that could positively impact their perceptions of the long-term setting and that may attract new graduates to work in this area.
EFFECT OF KINESIO® TEX TAPE ON THE EMG ACTIVITY OF MUSCLES IN HEALTHY COLLEGE-AGED MALES DURING GLENOHUMERAL UPWARD ROTATION IN THE SCAPTION PLANE: A CONTINUATION STUDY

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Study Design: Repeated measures design, mean EMG measured wearing Kinesio® Tex tape, sham taping technique, and without tape in all subjects, a continuation study.

Objective: To compare the mean EMG of the serratus anterior, deltoid, lower trapezius, and upper trapezius muscles with and without Kinesio® Tex tape applied to healthy college-aged male subjects, when compared to the mean EMG with sham treatment.

Background: Previous research has shown inconsistent change in muscle activation when comparing Kinesio® Tex tape to sham taping technique at the glenohumeral joint, which suggests further research is needed to demonstrate clinical efficacy of Kinesio® Tex tape.

Methods and Measures: Ten healthy male subjects without a history of shoulder pathology were voluntarily recruited from the University of Mary. Subjects were randomized into intervention or sham groups with randomized tape application. Subjects performed shoulder flexion in the scapular plane with and without Kinesio® Tex tape. Surface electrodes were applied over the serratus anterior, deltoid, lower trapezius, and upper trapezius to record EMG. The average mean surface EMG of five trials with tape-on and tape off was taken as the mean EMG (µV) score for each subject; then analyzed using a paired t-test for each muscle.

Results: There were no significant changes ($P > 0.05$) in the mean EMG from the untaped to the taped condition in any of the tested muscles. However, when compared to subjects receiving the sham taping technique, the subjects receiving the real taping technique seemed to experience greater increased mean EMG changes in the serratus anterior (2.9 µV) and greater declines in the mean EMG in the upper trapezius (3.2 µV) during the taped condition.

Conclusions: The Kinesio taping method used in this study did not result in statistically significant changes in muscle activation during shoulder flexion and extension in the scapular plane.

Key Words: Kinesiotape, muscle activation
Purpose: This study was conducted to compare cardiac stress indicators in one-repetition max (1RM) versus multiple-repetition max (MRM) strength assessments. It was hypothesized that MRM would induce greater cardiovascular stress.

Methods: A mixed-design was used, where researchers compared effects of MRM and 1RM using Life Fitness upper body chest press machine (machine model PSCPSE). Twenty untrained sedentary male subjects, ages 19-28 years, were divided into overweight (N=10) and obese (N=10) groups with BMI levels at 25.0-29.9 and 30.0-40.0 kg m², respectively. Subjects performed MRM and 1RM in randomized order, with at least 48 hours between tests. Heart rate (bpm), blood pressure (mmHg), blood lactate (mmol/L), and N’ Terminal pro Brain Natriuretic Peptide (NT proBNP; pg/dL) were measured at baseline, immediately post, and 15 minutes post strength assessment.

Statistics: ANOVA with repeated measures was conducted using IBM SPSS Statistics 23. Significance was determined at p< 0.05.

Results: A time (baseline to immediate post to 15 min post) X BMI category interaction was found for systolic blood pressure for both 1RM (F= 7.334, df=1, p=.014) and MRM (F=7.296, df=1, p=.015), and diastolic blood pressure for both 1RM (F=4.559, df=1, p=.047) and MRM (F=9.911, df=1, p=.006), where obese individuals had higher blood pressure responses compared to overweight for both 1RM and MRM. A time X BMI interaction did not occur for the other variables. Significant increases in all variables except NTproBNP were observed from baseline to immediate post (p<.05) in both 1RM and MRM. Significant differences in heart rate were found between 1RM and MRM immediate post (1RM = 122 bpm, MRM = 147 bpm; p = .000), and blood lactate immediate post (1RM = 3.0 mmol/L, MRM = 5.7 mmol/L; p = .000) and 15-minute post (1RM = 1.9 mmol/L, MRM = 4.1mmol/L).

Conclusions: Physiological stress was greater in MRM compared to 1RM, as determined by heart rate and blood lactate responses. Blood pressure responses were higher in obese compared to overweight males. No changes occurred in NT proBNP. These findings suggest MRM may induce greater cardiovascular stress compared to 1RM. Further research is needed in older, patient populations, and females.
PAIN PERCEPTION IN COLLEGIATE LEVEL MEN’S SOCCER PLAYERS

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Design: Retrospective Case Control Study

Objective: To understand how past painful experiences influence current perceptions of pain of men’s collegiate level soccer players.

Background: The purpose of this study was to determine how pain is perceived, in 19-25 year old male collegiate soccer players, through the use of the McGill Pain Questionnaire-Short Form (MPQ-SF), and an electrical stimulation machine used to manage pain, known as a Transcutaneous Electrical Neuromuscular Stimulation (TENS) unit. This type of electrical stimulation treatment has been used in previous pain perception studies. The goal of this study was to investigate trends in how pain is perceived by individuals based on their injuries sustained from the past year, and the perception of pain sensation from a given electrical stimulation treatment.

Methods and Measures: This study is a retrospective case control study. Participants reported their past injuries, and then were administered an electrical stimulation treatment. After receiving the stimulation, the participants will rate their perception of the stimulation. Data was collected by using a health history form and the McGill Pain Questionnaire on past injuries and the injuries’ levels of pain perceived by collegiate men’s soccer players. The McGill Pain Questionnaire was also used to describe current pain perceptions as it related to the players levels of perceived pain of one treatment of electrical stimulation. Descriptive statistics were used to describe the means and differences of the variables. Pain perceptions of the past injuries and TENS unit treatments were analyzed with an ANOVA statistical analysis, using a p value set at ≤ 0.05 for statistical significance.

Results: The results were not statistically significant for pain perceptions of the first or any second injuries sustained by collegiate soccer players during the 2015 season, compared to TENS treatment pain perceptions.

Conclusion: The study did show that past painful experiences may have an influence on current pain perceptions in collegiate male soccer players if their injuries were severe.

Key Words: Pain perception, past injury, TENS for pain, pain categories
DETERMINE THE EFFECTS OF THE PILATES REFORMER ON PERCEPTION OF FLEXIBILITY IN MIDDLE-AGED WOMAN AGES 35-55

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**Purpose:** The purpose of this study was to determine if the Pilates Reformer increases the perception of flexibility in middle-aged woman.

**Methods:** The study consisted of 27 women ranging in age from 35-55 years old. All study participants had experience with the Pilates Reformer at a wellness center location in North Dakota. To determine if utilizing the Pilates Reformer increased the participants’ perception of flexibility, a questionnaire was administered. Participants completed the questionnaire after concluding their normal Pilates Reformer exercise session. The questionnaire consisted of 15 questions regarding the Pilates Reformer and flexibility. Each question in the questionnaire was based on the Likert scale and coded with a number 1-5 to determine a mean average for each participant.

**Statistical Analysis:** The questionnaire data was analyzed using descriptive statistics to measure the mean, median, mode, variance, and standard deviation of the questions.
PATIENT DISCHARGE EDUCATION IMPROVEMENT PROJECT

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Study Design: Data collection, descriptive and frequency data

Objective: To determine if in an outpatient surgical patient care setting offering consistent pre-op discharge pain expectation education compared to no pre-op discharge pain education will improve the surgical readmission rate to the emergency department within seven days of procedure.

Background: Jamestown Regional Medical Center (JRMC) has an average 1.2% Emergency Department (ED) return rate for surgical patients post outpatient procedure. This intern equals 36% of the surgical patient ED volume at JRMC in 2015. This percentage was noted by Administration as a quality concern. JRMC’s mission focuses on quality improvement and best practices and JRMC key stakeholders were the driving force for the development of this project. The DNP project sample consisted of surgical staff nurses and surgeons associated nurses with JRMC. The DNP project consisted of pre and post-operative discharge patient teaching, reinforcement follow up calls, use of a comprehensive DNP created data checklist and monitoring of data showing hospital return rates within seven days of discharge.

Results: Surgical return rates were calculated and the data findings showed that in February the post op return rate were 0.5% and in March calculated at 1.2%, this is an average of 0.85%. The data analysis is showing an improvement in surgical ED returns.

Conclusion: Patient Discharge Education was found to improve readmissions inversely improving patient outcomes after outpatient surgery. Providing consistent patient teaching prior to and after surgery with reinforcement was a key element of success for the project. The Patient Discharge Education Improvement Project demonstrated improvement in surgical ED returns at JRMC.

Key Words: post-op readmission rates, outpatient surgical post-op pain control, and outpatient surgical discharge complications
ADDUCTOR CANAL BLOCK VS ADDUCTOR CANAL BLOCK WITH LOCAL ANESTHETIC EXPAREL FOLLOWING UNILATERAL TOTAL KNEE ARTHROPLASTY: PRELIMINARY RESULTS

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Study Design: Prospective Case series

Objective: To determine the effectiveness of Exparel, a local anesthetic, in patients undergoing a unilateral total knee arthroplasty (TKA) on the outcome measures of hospital length of stay (LOS), total hospital cost, total ambulation distance, Timed-Up-and-Go (TUG) score, and pain using the Visual Analog Scale (VAS).

Background: Healthcare organizations and hospitals are searching for more efficient means to decrease costs and improve patient outcomes for TKA. While adductor canal blocks (ACB) have been found to be superior to femoral nerve blocks (FNB) in the postsurgical outcomes of TKAs, there is limited research comparing the use of an ACB with and without the use of Exparel.

Methods and Measures: 3 healthy subjects, mean age of 73 years (range: 67-78 years), underwent a unilateral TKA and were randomly assigned to group A, with researchers blinded whether the patients were placed in the experimental or control group. Group A could consist of the experimental group (ACB with Exparel in a liposomal suspension, and standard surgical medications including 30mg of Toradol and 10mg of Morphine) or control group (ACB with 30ml of 0.25% bupivacaine with epinephrine, and standard surgical medications). The defined outcome measures were recorded during physical therapy sessions in the acute care hospital.

Results: Based on the preliminary results, there appears to be a positive relationship between the TUG score and pain rating using VAS among the three subjects under study. Between each patient, they averaged a time of 26.69 seconds for the TUG score, 150’ for total ambulation distance, and approximately the same LOS between each patient at 1 day and 6 hours before discharge from physical therapy.

Conclusions: Additional subjects are needed to determine statistical significance of the defined outcome measures between the experimental and control group.

Key Words: Total knee replacement, total joint replacement, intra-articular local anesthetic, bupivacaine with epinephrine, hospital costs
A COMPARISON OF ANTERIOR KNEE PAIN IN COLLEGIATE NCAA DIVISION II TRACK AND FIELD ATHLETES

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**Design:** Survey and Mixed Methods Study

**Objective:** To better understand if there is a higher prevalence of anterior knee pain in collegiate distant runners compared to collegiate track and field jumpers.

**Background:** The purpose of this study is to investigate if anterior knee pain (AKP) is more prevalent in collegiate distance runners compared to other collegiate track and field athletes whom participate in jumping activities. Athletes of NCAA Division II Collegiate Track and Field team with existing anterior knee pain were surveyed. Data was collected using the International Knee Documentation Committee Form IKDC. The projected outcome of this study is that the distance runners may be more prone to anterior knee pain versus other collegiate track participants, even those whom participate in jumping activities. Anterior knee pain is the most common complaint among the running participants.

**Methods and Measures:** Researchers utilized the IKDC survey form that measures the amount of knee pain and overall condition of the knee and its function. Descriptive statistics were completed on the data to provide information if anterior knee pain is more prevalent in collegiate distance runners, when compared to other collegiate track and field athletes whom participate in jumping activities, what type of track and field athlete is more prone to anterior knee pain location of pain, the duration of practice or game when the pain occurs, will be the data collected for statistical evidence. Independent t-tests were be used to compare the overall scores between distance runners and track and field jumpers. Statistical significance was set at p ≤ .05.

**Results:** Track and field runners have more AKP when compared to track and field jumpers. This study was not statistically significant. A limitation of this study was its small sample size.

**Conclusions:** The study did show that AKP is more prevalent in track and field runners. Clinical importance of this study may be that anterior knee pain is a condition experienced by both runners and jumpers in collegiate track and field and it should be managed appropriately in this population.

**Key Words:** Anterior Knee Pain, Anterior knee pain in college runners, anterior knee pain in college athletes, jumper’s knee, runner’s knee, IDKC Subjective Knee evaluation form AND College Athletes

2016 School of Health Sciences Colloquium
DIFFERENCE IN INJURY RATES OF COLLEGE FOOTBALL PLAYERS WHEN COMPARING INJURY PREVENTION SCREENING PROCESS

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The purpose of this study is to compare the injuries sustained to collegiate football players utilizing two different screening processes. This study will determine if a new pre-participation screening process will reduce the rate of injuries to freshmen and transfer football players at the University of Mary. During 2012-2014, there had been 131 injuries to football players at the University of Mary. Of those 131 injuries, 83 injuries (63%) involved freshmen or transfer students. In an effort to reduce the number of players injured, the sports medicine and strength and conditioning staffs at the University of Mary developed a new pre-season screening process. This program differed from the previous screening program by involving a functional movement screening (FMS). In the past, the process consisted of a Joint Physical. This was performed by looking at the stability of the ligaments at each joint. The new process incorporates movements from the FMS to find musculature imbalances, or movement deficits that could cause injury. By recognizing these deficits/imbalances, a pre-rehabilitation program can be developed to reduce the chance of injuries. A comparison of the injury rate data found that utilizing a preseason screening with a functional movement aspect helped reduce total injury rates by 32%, or 25 injuries. Also, preventable injuries were reduced by 23%, or 18 injuries with the implementation of the new screening process.
Improving Compliance with Antipsychotic Monitoring in the Psychiatric Population

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Psychiatric patients often die earlier than other patients and this is normally due to very treatable illnesses, not their mental illness. One such illness is metabolic syndrome, a cluster of risk factors that can pave the way to diabetes and heart disease. It is well documented in the literature that metabolic syndrome is often a consequence of antipsychotic medications used to treat a variety of mental health conditions. National agencies have recognized the risk of development of metabolic syndrome and have developed consensus guidelines for mental health providers to follow as they screen these patients at designated intervals for early signs of metabolic syndrome. In clinical practice however, there are many barriers to this routine follow-up. One way to improve compliance with this monitoring among mental health providers, is through the use of an electronic reminder system, built in to an electronic medical record system. It is hypothesized that use of this system will allow clinicians to do a better job of catching metabolic syndrome early. This will lead to early intervention and treatment for these patients thereby reducing morbidity and mortality in this already at-risk population.
THE EFFECT OF A MULTIDISCIPLINARY COMMUNITY-BASED PROGRAM ON FALL RISK AND BALANCE CONFIDENCE IN OLDER ADULTS: A CONTINUATION STUDY

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Study Design: Pre-test: Post-test single group design.

Objective: To determine the effectiveness of the Stepping On multidisciplinary fall prevention program on fall risk and balance confidence in community-dwelling, cognitively intact, older adults who are at risk of falling, have a fear of falling, or have fallen previously.

Background: Falls are a major health concern among older adults and often lead to related injuries and possible death. Multifactorial fall prevention programs, much like the Stepping On program, are proven to reduce the incidence of falls.

Methods and Measures: Twenty six volunteers aged 60+ who were at a fall risk participated in this study. Each subject participated in the Stepping On program that met for 2 hours per week for 7 weeks. Participants were tested using the 10 Meter Walk Test (10MWT), Functional Reach Test (FRT), Five Time Sit To Stand (FTSST), and Falls Efficacy Scale International (FES-I). These tests were administered prior to the first session and immediately following completion of the program to assess fall risk and balance confidence.

Results: After completing the seven-week Stepping On fall prevention program, the participants (n=26) demonstrated statistically significant improvements in all of the outcome measures which included the 10MWT, FRT, FTSST, and FES-I (p<0.05). These results may indicate a decreased risk of falls and improved balance confidence in the participants as a result of the Stepping On program.

Conclusions: The results of this study suggest that the multidisciplinary approach of the Stepping On program is an effective intervention to reduce fall risk (as measured by gait speed, reaching out of the base of support, and completing multiple sit to stand transfers), and improve balance confidence in community-dwelling older adults.

Key words: Stepping On program, geriatric exercise, fall prevention
A STUDY OF KT TAPE AND ITS USE IN THE REDUCTION OF KNEE PAIN

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Purpose: The purpose of this study was to evaluate the ability of Kinesio Tape to reduce knee pain during activity in individuals experiencing general knee pain.

Subjects and Methods: The participants were limited to individuals 18-26 years of age, who regularly exercised at a moderate activity level, and had no history of surgical intervention of the lower extremity. Participants were asked to abstain from additional physical activity that required more energy expenditure outside of activities of daily living, such as running, swimming, or lifting, one week prior to the beginning of testing. Each participant was than required to complete a functional lower extremity evaluation (FLEE) that consisted of jumping, squatting, running, cutting, and shuffling. A pain scale rating was recorded before and after the FLEE regarding the subjects knee pain. Following an additional week of abstinence from physical activity, participants performed the same evaluation, with the exception of Kinesio Tape being placed on the knee(s) that the subject indicated pain prior to the FLEE. Pain scale ratings were once again recorded before and after the FLEE.

Results: At this time results are pending. Our study will be completed on April 22, 2016. Our expected results are that patients will have decreased pain with the use of KT tape.

Conclusion: At this time we can draw no conclusions about our study. Our study will be completed on April 22, 2016, at which time we will be able to compare the before and after results of the FLEE evaluation.
PELVIS STABILIZATION EXERCISES IMPLEMENTED TO DECREASE LOWER LIMB INJURIES IN HIGH SCHOOL GIRLS’ BASKETBALL PLAYERS

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Purpose: This study is designed to determine if the implementation of pelvic stability exercises during a rural girls’ basketball team’s warm-up will decrease lower limb injuries.

Methods: This study is a retrospective. The sample population for this study consists of participants from a girls’ varsity basketball team, ranging from 14-18 years of age. The study will be comparing the amount of lower limb injuries that occurred during the 2014-2015 basketball season compared to the 2015-2016 basketball season. The two seasons differ in the use of pelvic stability exercises during practice warm-ups. During the 2015-2016 season participants performed pelvic stability exercises during practice warm-ups. The pelvic stability exercises were incorporated under the direction of the basketball coach. The 2014-2015 season used no pelvic stability exercises during warm-up. The data analysis will focus on the amount of lower limb injuries that occur each season.

Statistical Analysis: A p value of p≤.05 will be used to prove statistical significance.
EARLY RECOGNITION OF SEPSIS DURING TRIAGE IN THE EMERGENCY ROOM,
A DNP PROJECT

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Introduction: Sepsis is the result of a clinical syndrome causing dysregulated inflammatory response to infection. The occurrence and presentation of sepsis is difficult to predict. We know recognition and early detection of sepsis greatly impacts care and outcome of patients in this disease state. An estimated 0.7 percent of emergency room patients present with suspected severe sepsis; more than two thirds of sepsis patients present initially to the emergency department (Tintinalli et al., 2011). Healthcare costs related to sepsis reached $20.3 billion in 2011 (Torio & Andrews, 2013). Sepsis exceeded the rates of colon cancer, breast cancer and AIDS with its affects felt in 750,000 Americans a year (CDC, 2014). The aim of this quality improvement project was to implement an educational module to enhance assessment skills of nursing staff in the emergency department for the identification and recognition of patients with possible signs of septicemia and analyze the effectiveness of the intervention.

Methodology: This quality improvement project was the review and formative evaluation of a sepsis education module incorporating disease state, evidence based medicine and pre-project implementation assessment of nurse septicemia knowledge compared to post project knowledge in emergency room nurses at an emergency department between February 2016 and March 2016.

Conclusion/Significance: As a result of this education module, it was shared with additional nursing units within the facility. Emergency room nursing staff completed the module at a rate of 11%, reporting self-improvement with utilizing a sepsis protocol for identification of the septic patient, notifying attending providers of findings and recording with reevaluation of patient vital signs pertinent to septicemia findings. Impact of the project was not able to be deemed statistically significant in relation to increase of septicemia patients identified due to scope and time frame.

Key Words: Sepsis, Septicemia, Severe Sepsis, Systemic Inflammatory Response Syndrome/SIRS, Surviving Sepsis Guidelines