Methodist University's OTD Program Presents the

2nd Scholarship Symposium
Class of 2021 Capstone Research Presentations

July 23 | 8 a.m. - 4:30 p.m.

A livestream and recorded event:
https://us02web.zoom.us/j/3890771091
Meeting ID: 389 077 1091

METHODIST UNIVERSITY

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Introduction to the OTD Symposium

These student presentations represent a component of the OTD curriculum that meets the educational standards for scholarship and evidence-based practice. The Clinical & Community Capstone Scholarly Project is part one of the capstone curriculum and begins in the summer term of the first year of the program. This project is mentored by a faculty member and is aligned with the mentor's scholarly agenda. Completion of the Capstone Scholarly Project prepares the student and serves as the impetus for the culminating Capstone Experience. It generally begins with a literature review, PICO question generation, traditional qualitative or quantitative methods of inquiry, and culminates in the final didactic semester of the program with peer-reviewed dissemination efforts.

OTD Scholarly Agenda

Our departmental faculty scholarship agenda seeks to build quality evidence that spans the depth and breadth of the occupational therapy profession. The OTD program faculty, in collaboration with our students, strive to advance the profession through scholarly engagement, enrichment, and empowerment. Collectively, our scholarly work will create a well-rounded, creative, and collaborative environment that uses a multidisciplinary approach to incorporate the basic and applied sciences, including rehabilitation science, health and wellness, social sciences, and engineering. Pragmatically, our research is grounded in theory, molded by the grant-writing process, and executed in clinical and community-engaged settings. Simultaneously, our faculty scholarship agenda coincides with the evidence-based practice and research course series, allowing us to build a strong peer-mentor relationship with our OTD students and foster student-led capstone scholarship. The ultimate goals of our work are to create evidence-driven occupational therapists and scientists who will contribute to advancing human health and wellness through participation in everyday life activities.

Faculty Capstone Mentors

Cindy Erb, OTD, OTR/L, C/NDT, CLT
Matthew Foreman, Ph.D.
Meredith Gronski, OTD, OTR/L, CLA
Dana Kolbfleisch, OTD, OTR/L
Amy Spence, OTD, MSEd, OTR/L

July 23, 2021 | 8 a.m. to 4:30 p.m.

8 - 8:15 a.m.	Opening Remarks	Meredith Gronski, OTD, OTR/L, CLA
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9 - 9:15 a.m.	Movement and Learning: Understanding Early Childhood Educators' Perspectives	Kelsey Rueblinger & Alexis Walters *Mentor: Gronski*
9:15 - 9:30 a.m.	The Process of Designing a 3D Printed Prosthesis for a Young Child with an Upper Extremity Difference	Margaret Berger *Mentor: Gronski*
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10: 45 - 11 a.m.	Protocol for Utilizing a Therapeutic Horseback Riding Program to Influence Classroom Behaviors in High-School Aged Special Education Students	Haley Bennett *Mentor: Foreman*
11 - 11:15 a.m.	A Comprehensive Assessment to Examine the Relationships Between Muscle Power, Performance Skills, and Functional Classifications in Wheelchair Basketball Athletes	Shantavia Morgan *Mentor: Foreman*
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Agenda, Continued

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The 2nd Occupational Therapy Symposium Presentations
July 23 | 8:15 a.m. - 4:30 p.m.

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8:15 - 8:30 a.m.

THE EFFECTS OF NICU HOSPITALIZATION ON SENSORY PROCESSING SKILLS AND ADLS IN YOUNG CHILDREN

Author: Carson Williams
Mentor: Dr. Meredith Gronski

BACKGROUND: Premature birth places infants at risk for abnormal sensory and motor development. Intense and noxious sensory stimuli within the neonatal intensive care unit (NICU) environment can negatively impact sensory processing skills and functional abilities of young children. The purpose of this study was to describe the relationship between prematurity, NICU hospitalization, sensory processing patterns (SPPs), and performance of ADLs in early childhood.

METHODS: A cross-sectional study was completed with convenience samples of both preterm and full-term children. A caregiver of each participant completed a demographic questionnaire, as well as a set of standardized assessments including the Infant Toddler Sensory Profile (ITSP), the Brief Infant Sleep Questionnaire (BISQ), and the Neonatal Eating Assessment Tool (NeoEat) or the Pediatric Eating Assessment Tool (PediEAT), depending on the age of the child participant. Descriptive statistics were used to compare the relationships between preterm birth, NICU hospitalization, and SPPs as they relate to ADL eating/feeding performance and sleep.

RESULTS: Eight preterm children and 10 term children participated in the study. No differences between SPPs, feeding and eating abilities, and sleep were found between the preterm and term groups. However, within the age-matched case comparison of two infants six-seven months old, differences in feeding and sleep patterns were trending toward clinical significance, showing differences in ADL performance capabilities.

CONCLUSION: Despite there being no clinically significant group differences found within this study, the age-matched case comparison demonstrates that infants born prematurely and hospitalized in the NICU may have a higher likelihood of experiencing ADL performance difficulties in early childhood. Future research should aim to further explore the relationship between NICU hospitalization, SPPs, and ADL performance in preterm infants to emphasize the need for early identification and treatment of atypical sensory processing abilities that affect daily functional outcomes.

8:30 - 8:45 a.m.

PRACTICE APPRAISAL OF SENSORY & BEHAVIORAL FEEDING APPROACHES WITH YOUNG CHILDREN AGES BIRTH-5 YEARS

Author: Lauren Thomas
Mentor: Dr. Meredith Gronski

BACKGROUND: Nearly half of all infants and young children have an identified feeding problem. Feeding difficulties can be both intrinsic to the child or a product of food properties (extrinsic), and as a result, can produce excessive stress on caregivers since feeding involves caregiver participation.

METHODS: A practice appraisal design was selected to assess the existing literature found on feeding interventions through a scoping review, and then this information was utilized to formulate a practitioner survey to compare findings. Discoveries from both were then compared to determine any gaps. The target recruitment population for the practitioner survey was identified using inclusion and exclusion criteria. Only current pediatric occupational therapy practitioners working with children age birth to 5 years who have feeding difficulties were included in analysis.

RESULTS: A total of 81 participants responded to the survey but only completed responses were included in the final analysis. Over 95% of respondents preferred parent and caregiver education for treatment approach with feeding difficulties. A majority indicated they did not hold any specialty certifications (71%) and 81% utilized CEUs/course materials for acquiring supports for practice in feeding/eating. Perceived competency level/level of preparedness was assessed via a 10-point Likert scale, with most of the respondents indicating a competency level between 5-8.

CONCLUSION: Based on the occupational therapy practitioners' feedback via the survey, it is evident that the sensory and behavioral approaches to feeding difficulties found in the literature closely align with what current practitioners are using in practice. Positive outcomes were recorded, but further research is needed to assess the clinical significance of these approaches when used in practice for children of varying diagnoses with feeding difficulties. Further research is needed to assess the clinical significance of the reported sensory and behavioral approaches used in practice as compared to the literature, and to further analyze the low competency levels reported by practitioners when treating feeding and eating difficulties.

8:45 - 9 a.m.

THE THERAPEUTIC AND DEVELOPMENTAL BENEFIT OF NATURE-BASED PROGRAMS ON THE DEVELOPMENT OF PLAY SKILLS

Author: Karli Kury
Mentor: Dr. Meredith Gronski

PURPOSE: The purpose of this study was to determine the therapeutic and developmental benefits of attending a nature-based preschool in comparison to a traditional preschool setting as well as how each environment impacts the development of play skills in children.

BACKGROUND: A child's main occupation is play and if play is hindered, children may experience developmental delays. Unstructured play is crucial for normal growth and development. Nature provides a therapeutic experience that fosters unstructured play which leads to healthy growth and development in children. It is crucial that developmental processes occur naturally through play and exploration in order to promote healthy development and prevent complications or delays from occurring later in life.

METHOD: This study is an observational, case-control comparison that compares play skills and environmental supportiveness of a nature-based preschool setting and traditional preschool setting. Each participant's play skills are assessed using the Test of Playfulness Measurement (ToP) and each preschool program environment is scored using the Test of Environmental Supportiveness (TOES).

RESULTS: The TOES score for the nature-based setting indicated that it supports play. Child A was actively engaged due to their environment. The TOES score for the traditional pre-school setting indicated that play was more restricted in this child's environment. The results show that Child A in the nature-based setting achieved a higher raw score on the ToP compared to child B who was observed at in the more restrictive traditional preschool setting.

CONCLUSION: This study indicates children who attend a nature-based program may have more opportunity in the environment to develop play skills due to the unstructured and self-guided play, and the therapeutic benefit that nature has to offer.

THE BENEFIT OF NATURE-BASED EARLY CHILDHOOD PROGRAMS

Author: Anastasia Pona
Mentor: Dr. Meredith Gronski

BACKGROUND: Lack of daily physical activity (PA) in pre-school aged children in the natural outdoor environment has been linked to negative impacts in areas of development relating to cognition, social and emotional well-being, and motor skills. Evidence suggests that fundamental concepts are learned during active involvement with the environment.

METHOD: A case-control study was completed comparing the PA and school readiness scores in a child in a nature-based early childhood program (N-ECP) and a child in a traditional early-childhood program (T-ECP). Activity counts were measured using ActiGraph GT3+ accelerometers which were worn on the non-dominant wrist.

RESULTS: In one week, the N-ECP child recorded more activity counts than the T-ECP child. Although the child at the N-ECP had more activity counts no conclusive evidence was found regarding school-readiness in either child due to unforeseen circumstances of the study.

CONCLUSION: Nature based preschools may prove beneficial in preparing children for school through unstructured, outdoor play. Follow up research can be completed to determine impact on school readiness between nature based preschool and traditional preschools.

9 - 9:15 a.m.

MOVEMENT AND LEARNING: UNDERSTANDING EARLY CHILDHOOD EDUCATORS' PERSPECTIVES

Author: Kelsey Rueblinger & Alexis Walter
Mentor: Dr. Meredith Gronski

BACKGROUND: Modernizing the curriculum within early childhood education has resulted in more academic instruction and less time spent in play-based learning and learning through movement. Movement-based learning and links to development have been an advancing priority in early childhood education research. Early childhood educators (ECEs) are able to integrate learning and movement in young children's education to support both educational and developmental outcomes simultaneously.

METHODS: One focus group and one key informant interview were conducted to investigate ECEs current knowledge about movement and learning, their application of these concepts in their current curriculum, and supports and barriers to implementing movement and learning strategies. Researchers used transcription and inductive coding to discover key themes from the data.

RESULTS: Overall, major themes gathered demonstrated a need for increased resources and professional development opportunities to overcome perceived barriers.

CONCLUSION: Future program development efforts should include in-services or staff development programs as methods of modifying early childhood education curriculum to include movement and learning concepts.

9:15 - 9:30 a.m.

THE PROCESS OF DESIGNING A 3D PRINTED PROSTHESIS FOR A YOUNG CHILD WITH AN UPPER EXTREMITY DIFFERENCE

Author: Margaret Berger
Mentor: Dr. Meredith Gronski

BACKGROUND: Over a thousand infants are born each year with upper extremity differences, generating challenges in essential occupations for childhood development. Three-dimensional (3D) printing is an emerging area in occupational therapy rehabilitation for creating customized assistive devices. The purpose of this project was to describe the process to design and assemble a 3D-printed prosthetic device for a young child with an upper extremity difference.

METHODS: One participant with an upper extremity difference was included to feasibly develop an appropriate process for creating 3D printed prostheses. Standardized, quantitative assessment measures were utilized to assess occupational performance, participation, and quality of life of the participant, with qualitative information gathered through parent interview. Anthropometric measurements of the upper extremity were recorded in order to ensure proper sizing of the prosthesis. A prosthetic design was identified on an online repository and customized according to anthropometric measurements.

RESULTS: Printing and assembly resulted in final prototype that was deemed appropriate for use with the participant. This project demonstrated that it is feasible to design, customize, and print an affordable and usable device utilizing occupational therapy perspectives and assessments. Preliminary data collection establishes an assessment battery for evaluating occupational performance, participation, and quality of life for a young child with an upper extremity difference who could benefit from a customized prosthesis.

CONCLUSION: Future work should assess the impact of upper extremity prostheses on occupational performance, participation, and quality of life in young children to determine potential functional implications.

9:30 - 9:45 a.m.

EFFECTS OF EARLY POWERED MOBILITY ON RESILIENCY FACTORS IN CHILDREN AGES 0-3: CASE REPORT OF A CHILD WITH NEMALINE MYOPATHY TYPE 2 (NEM2)

Author: Lauren Frey
Mentor: Dr. Meredith Gronski

INTRODUCTION: Resiliency supports physical, mental, social, and emotional well-being and is vital to the development of a child with mobility impairments. Children with mobility impairments often have additional developmental delays that limit optimal exploration of their environments. Resiliency is integral to the capacity for cognition, healthy attachment relationships, motivation to learn, and regulation of emotions.

PURPOSE: The aim of this study was to explore how early powered mobility affected resiliency factors associated in a young child with a mobility impairment.

METHODS: This study used a convenience sample for a pre-test/post-test case report design. The physical therapist that worked closely within this research study recruited this participant as she was the lead of the study. This study was completed at Methodist University and in the child's home. Incentives for participation include the use of novel, affordable, low-technology interventions in order to promote mobility, participation, and resiliency for the child during play and interactions in their home environment.

RESULTS: The participant was a 15-month-old female with mobility impairments with a diagnosis of Nemaline Myopathy Type 2 (NEM2). Consistent with other studies with children with mobility, the participant responded to the car well and progressed towards basic powered mobility goals. The participant demonstrated increased exploration in surroundings, play repertoire, mood, eye contact with others, emotional regulation, and consumption of age-appropriate food independently.

DISCUSSION: The findings of this study provide support for early-powered mobility to increase factors related to resilience such as problem-solving, self-initiated exploration, self-regulation of emotion and behaviors, as well as improved attachment quality in the caregiver-child relationship.

CONCLUSION: One young child with mobility impairments demonstrated improved performance of resiliency-related factors following a 9-week intervention using a MROC. Although these findings are not generalizable, they provide insight to further research in order to determine the effects power mobility on improved resilience measures.

Author: Mikayli Rhoney
Mentor: Dr. Meredith Gronski

PURPOSE: The purpose of this single-subject case study was to determine the effects of using a modified ride-on toy car with a child who has impaired mobility to increase participation in the home environment.

BACKGROUND: Movement allows young children the opportunity to learn and grow in their environment. As independent mobility is critical for social participation, it is vital to provide environmental supports as early as possible to children at risk for a developmental motor delay to optimize function and participation in home environments. Modified ride-on cars (MROC) are an emerging mobility device option to provide environmental supports, with several benefits, including relatively low-cost (<$500) and accessibility to families, clinicians, and community members for use by young children.

METHOD: One 15-month-old child with a diagnosis of Nemaline Myopathy Type 2 (NEM2) was observed using a MROC in the home environment for 9 weeks. The home domain of the YC: PEM and PEDI were compared at pre and post-intervention to determine the child's performance of basic skills including self-care, mobility and social function. A weekly activity log was completed by the family each week to track MROC use and enjoyment.

RESULTS: The findings of this study further increase support of evidence that early powered mobility helps to increase independence and participation for a child with limited mobility in their home. The modified ride on car was most effective in the increase of the child's functional skills of self-care, mobility, and social participation from pre-test to post-test.

CONCLUSION: The results from this case report join other work in suggesting that young children can learn to use powered mobility devices and benefit from the use of it in their home environment.

10 - 10:15 a.m.

RELATIONSHIP BETWEEN PRE-SLEEP SCREEN TIME AND QUALITY OF SLEEP IN A GRADUATE STUDENT: A SINGLE SUBJECT DESIGN

Author: David Tyler Jones
Mentor: Dr. Matthew Foreman

BACKGROUND: Previous studies have shown the use of light-emitting devices immediately before bedtime affects the human circadian clock, decreases subjective sleepiness, suppresses melatonin secretion, lengthens sleep latency, delays sleep propensity, decreases rapid eye movement (REM) sleep propensity, and impairs morning alertness in healthy adults. This study aimed to investigate quantitative and qualitative measures to determine the effect of pre-sleep screen time on quality of sleep using survey data and ballistocardiography in a graduate student.

METHODS: This research followed a single-subject, A-B-C-A design with phases of baseline (A), decreased (B), and increased (C) pre-sleep screen time. A single graduate student was recruited through the Methodist University Doctor of Occupational Therapy Program. The design phases were ultimately altered due to non-adherence to the requested protocol – namely, a total of 28 data collection timepoints were binned into <45, 45-60, 60-75, 75-90, and 90-120 minutes of pre-sleep screen time. A sleep consensus diary and a ballistocardiography device were utilized to collect data. The device (Emfit IP-9360, Emfit Corp.) was placed under the participant's bed and used to automatically collect data related to sleep onset and heartrate variability.

RESULTS: A Kruskal-Wallis test showed significance (p=.04) between screen time and perceived sleep quality. Post-hoc pairwise Mann-Whitney U tests showed significant differences when comparing two paired pre-sleep screen time groups (the >45-60min group and the >75-90min group; the >75-90min group and the >90-120min group pairings). All other comparisons between pre-sleep screen time groupings were not significant.

DISCUSSION: Perceived sleep quality may be impacted more than sleep onset in relationship to pre-sleep screen time. Low frequency heart rate variability trended down with increased pre-sleep screen time, although it was not significant. This may suggest that increased pre-sleep screen time affected vagal tone. There were many limitations to this study, but it shows that sleep-related data can be gathered using an at home device in a familiar environment.

10:15 - 10:30 a.m.

THE EFFECTS OF MILITARY BOOT FITTING ON GAIT, OCCUPATIONAL PERFORMANCE, AND OVERALL WELLNESS OF U.S. SOLDIERS

Authors: Hannah-Leigh Barham
Mentor: Dr. Matthew Foreman

INTRODUCTION: Musculoskeletal injuries are the leading cause of hospitalizations, outpatient visits, disabilities, and manpower losses across the United States military. Current evidence shows that these injuries may be due to various factors, including high physical demands, large carrying loads, and footwear, specifically the military boot itself. However, little research has investigated these musculoskeletal injuries through a biomechanical lens in combination with a holistic occupational therapy approach. The purpose of the current study is to examine gait-related biomechanical changes due to the military boot in relation to client-reported history of pain and occupational deficits.

METHODS: A cross-sectional, observational study with a small sample (N=10) of active-duty military personnel was implemented. Participants were invited to the Methodist University Motion Analysis Laboratory to complete a series of three activities including: (1) walking gait, (2) walking gait w/ a 35-pound rucksack, and (3) running gait. Each activity was performed while wearing military boots (shod) and barefoot (unshod). Kinematic variables were measured by motion analysis cameras with markers placed on the participants' trunk and lower extremities. Kinetics were measured by embedded force plates. Participants were given a 10-question survey measuring chronic foot pain and overall occupational performance, satisfaction, and any current perceived barriers.

RESULTS: Participants reported knowledge of occupational therapy but that they do not know their role in injury prevention or location, three or more foot conditions from work-related activities, and "very dissatisfied" with education and training on injury prevention through the military. Changes in trunk, hip, knee, and ankle angles along with maximal ground reaction forces were compared across activities and conditions.

CONCLUSION: There may be a role for occupational therapy in injury prevention, health promotion, and ergonomic education related to the physical activity in the military boot for active-duty military personnel. Future work should include a larger sample control over footwear type.

10:30 - 10:45 a.m.

FEASIBILITY OF A NOVEL EQUINE-ASSISTED UPPER EXTREMITY INTERVENTION FOR PERSONS WITH NEUROLOGICAL MOTOR IMPAIRMENT

Authors: Shelby Gray Behnke
Mentor: Dr. Matthew Foreman

BACKGROUND: Prominent neurological disorders such as stroke, multiple sclerosis (MS) and Parkinson's disease (PD) commonly result in upper extremity (UE) motor impairment. Individuals living with a neurological disease can experience limited ability to perform activities of daily living due to such motor impairment. Hippotherapy and equine assisted therapy (EAT) have been shown to be beneficial interventions for motor impairment in children and some adult populations. Currently, there is a gap in the literature supporting EAT intervention for adults with UE motor impairment.

METHODS: This study utilized a case series design through a convenience sampling method to determine the effect of an equine brushing protocol on UE motor performance for individuals with neurological UE motor deficits. Participants were recruited from a therapeutic riding center with a diagnosis of stroke, MS, or PD. Maximal range of motion (ROM) measurements and the QuickDASH questionnaire were recorded prior to the protocol to assess UE functional limitations. The brushing protocol asked participants to perform a series of repetitive UE movements while grooming a horse, including submaximal movements of the shoulder, elbow, and wrist. Motor performance and trunk displacement were measured during the brushing protocol via a Polhemus G4 electromagnetic tracking system.

RESULTS: Data were analyzed to determine the average number or repetitions achieved per minute, maximum reach distance, and clinical UE ROM angles achieved by each participant during the brushing protocol.

DISCUSSION: This study demonstrates that an equine brushing protocol can challenge the UE and achieve an appropriate number of task-based repetitions to be considered as a therapeutic intervention for adults with UE motor impairments.

CONCLUSION: Data collection was ended abruptly due to the COVID-19 pandemic. Further data should be collected to determine areas of improvement for the brushing protocol and to establish efficacy over the course of an intervention.

10:45 - 11 a.m.

PROTOCOL FOR UTILIZING A THERAPEUTIC HORSEBACK RIDING PROGRAM TO INFLUENCE CLASSROOM BEHAVIORS IN HIGH-SCHOOL AGED SPECIAL EDUCATION STUDENTS

Authors: Haley Bennett
Mentor: Dr. Matthew Foreman

BACKGROUND: Therapeutic horseback riding (THR) is a form of animal-assisted therapy that has been shown to significantly benefit cognitive, psychological, and social domains for people of different ages and conditions. Strategies using THR can be employed for middle- and high-school aged children that are eligible for special education services, including diagnoses of cerebral palsy (CP), Down's syndrome (DS), and autism spectrum disorder (ASD). The current project outlines a four-week research protocol utilizing THR to affect the classroom behaviors of high-school aged individuals with a variety of diagnoses.

PROTOCOL: The protocol proposes a one group pretest-posttest study design with multiple measurement timepoints. A small sample of children will be recruited from a local special education class, with eligible diagnoses being CP, DS, and ASD. Initially, the teacher of the special education class will establish baseline behaviors via the Behavior Assessment System for Children (BASC-3). Once baseline behaviors are established, each participant will complete four consecutive weeks of THR sessions once a week at a local THR facility. Each THR session will consist of 30 minutes of riding and 30 minutes of an educational ground lesson. After these sessions, each participant will complete their school day as normal, and the students' teachers will complete a sensory survey based on their behaviors that day. One sensory survey will also be completed each week to establish baseline behaviors on non-riding days. At the end of the four-week intervention, the BASC-3 will be completed again for each of the participants. Pre- to post-intervention changes in BASC-3 as well as riding vs. non-riding day classroom behaviors will be compared.

CONCLUSION: Further research is needed to establish evidence for the effectiveness of THR on decreasing negative classroom behaviors in adolescents with special needs to bolster the claim that THR and hippotherapy should be included in sanctioned occupational therapy treatment plans and covered by government insurers.

11 - 11:15 a.m.

A COMPREHENSIVE ASSESSMENT TO EXAMINE THE RELATIONSHIPS BETWEEN MUSCLE POWER, PERFORMANCE SKILLS, AND FUNCTIONAL CLASSIFICATIONS IN WHEELCHAIR BASKETBALL ATHLETES

Authors: Shantavia Morgan
Mentor: Dr. Matthew Foreman

INTRODUCTION: Competitive sport for those with mobility impairment has been growing rapidly in recent years, and wheelchair basketball is considered one of the most popular sports for the disabled. Anyone who wishes to participate competitively in wheelchair basketball must first have a qualifying diagnosis and undergo a functional classification process. Currently, the player's classification system is based mainly on subjective evaluation of physical abilities during fundamental wheelchair basketball movements. The primary factors used to determine an individual's functional classification level are "volume of action" and "pelvic stability." We believe that a biomechanical approach including joint mobility, strength, endurance, and muscle power will create more reliable determinants for validating and predicting functional performance in wheelchair athletes.

PURPOSE: The purpose of this study was to develop a comprehensive assessment of wheelchair basketball athletes with varying diagnoses to explore relationships between impaired muscle power, motor function, and performance skills necessary for participation in the sport.

METHODS: The protocol was developed to assess aspects of strength, function, and performance by both objective and subjective methods. Strength measures consist of manual testing of important upper extremity (UE) muscles, hand grip dynamometry, and handheld dynamometry of the triceps muscles. Functional assessments include the standardized Disabilities of the Arm, Shoulder and Hand (DASH) assessment, the Nine-hole Peg Test (9-HPT), and goniometry of important UE joints. Performance-based assessments include a set of short sprints, a seated medicine ball throw, pushups while in the basketball wheelchair, and triceps dips while in the basketball wheelchair. Kinematics and kinetics of performance-based assessments are measured by motion capture cameras and floor-embedded force plates. This protocol was collated in an easy-to-use manual including straightforward instructions and images.

CONCLUSIONS: Future work should focus on a correlational study to determine relationships between the developed protocol and the existing wheelchair basketball classification system.

11:15 - 11:30 a.m.

A PROTOCOL FOR INTENSE VIRTUAL REALITY MOTOR REHABILITATION IN PATIENTS WITH CHRONIC HEMIPARESIS DUE TO STROKE

Author: Samantha Rodriguez
Mentor: Dr. Matthew Foreman

BACKGROUND: Stroke is a leading cause of chronic disability within the United States. Over half of the stroke population sustains long-term hemiparesis in the contralateral upper extremity. High-dosed repetitions of specific motor patterns facilitate neuroplasticity in attempts to recover or improve motor function of the affected extremity. Virtual reality (VR) has been shown to be an effective means to motivate patients to complete these high doses of movement. Unfortunately, many commercial VR systems are costly and inaccessible to typical neurorehabilitation clinics.

METHODS: The purpose of this project is to develop a research protocol that utilizes off-the-shelf motion sensors, custom software, and video games to facilitate high numbers of sustained upper extremity movements intended to improve motor control. This protocol involves a 12-week intervention in a pretest-posttest study design. Participants will perform VR-based rehabilitation three times a week in ~65-minute sessions. Changes in upper extremity function, motivation, and quality of life from pre- to post-intervention will be assessed with the Action Research Arm Test (ARAT), functional reach test, Inpatient Rehabilitation Facility Patient Assessment Instrument (IRF-PAI), Intrinsic Motivational Index (IMI), System Usability Scale (SUS), Jamar Dynamometer grip strength test, and the Stroke Specific Quality of Life Scale (SS-QOL).

PARTICIPANTS: Participants will be included if they (1) have had an ischemic stroke (>6 months prior), (2) are aged 35-75 years, and (3) have adequate motor function (ARAT > 20). Participants will be excluded if they (1) have significant cognitive impairment (MoCA < 26), (2) have visual field impairments, (3) have been diagnosed with dementia or other cognitive impairments, or (4) are unable to participate in VR-based games for ~65 minutes at a time.

CONCLUSION: The current project proposes a novel study protocol to advance evidence for the efficacy of VR-based motor rehabilitation to improve motor function, strength, and quality of life in persons with chronic hemiparesis due to stroke.

12:45 - 1 p.m.

CONTENT AND APPROACHES NECESSARY FOR A DRIVER'S EDUCATION PROGRAM FOR STUDENTS WITH AUTISM TO IMPROVE THEIR DRIVING SKILLS PRIOR TO THE ON-ROAD EXPERIENCE

Authors: Elizabeth White
Mentor: Dr. Cindy Erb

BACKGROUND: Recent statistics revealed an increase in the Autism Spectrum Disorder (ASD) diagnosis. As they age and wish to drive, there are currently no supports, such as additional in-class time, multiple methods of teaching, or learning simulations addressing potential on-road situations, to accommodate specific learning needs of these students. The purpose of this study is to determine additional content areas and approaches needed by students with ASD to improve their understanding and abilities within the multi-sensory demands of driving.

METHODS: To determine the needs and topic areas for an additional driver's education course between the in-class and on-road portion, parents of students with ASD planning to drive or obtained a driver's license completed an online survey through QuestionPro using a qualitative approach to assess challenges and suggestions to meet learning needs. Parents were excluded if the student had additional diagnoses beyond ASD.

RESULTS: Qualitative analyses conducted by researchers determined the need for an additional course and topic areas and teaching methods to include specific to students with ASD. These suggestions include environmental accommodations, testing accommodations, and additional experiences embedded into the course.

DISCUSSION: The need for an additional driver's education course is evident to increase success and safety of students with ASD who wish to drive. An occupational therapist should create and conduct this course based on specific knowledge of the diagnosis and knowledge of the skills requiring while driving. Based on the suggestions of the caregivers and research, a driver's education class prior to the on-road portion for students with ASD should include course accommodations, such as shorter classes, testing accommodations, individualized instruction, and increased engagement and motivation during activities. A variety of experiences, such as practicing operational controls, simulated driving, review of laws, and traffic scenarios is imperative to best meet the learning needs of students with ASD.

1 - 1:15 p.m.

WILL FEMALE VETERANS BENEFIT FROM AN ONLINE JOURNAL CLUB TO ADDRESS POST-DEPLOYMENT EMOTIONAL AND BEHAVIORAL CHANGES?

Authors: Hannah Diffenbaugh
Mentor: Dr. Cindy Erb

BACKGROUND: Notable research with statistical significance has indicated women experience more negative psychological consequences following deployment than their equivalent male comrades. Despite this awareness, no service exists to address the emotional and behavioral changes women experience post-deployment. The tenets of occupational therapy recognize this issue and its effects on individual ability to pursue and perform meaningful occupations, improve perceived self-efficacy, and pursue social interactions to improve health and quality of life. The purpose of this project was to distinguish the evidenced-based capacity of occupational therapy to develop an innovative, anonymous online journal club for military women to begin to address these formidable changes through non-threatening mindfulness activities.

METHODS: The original design of this project was unable to be actualized due to the unforeseen circumstances associated with the national COVID-19 crisis. A comprehensive portfolio was developed for future programmatic implementation. The QuestionPro Survey that was developed to collect anonymous participant background information, including Satisfaction with Life Scale (SWLS) contained within the survey, remain intact and available for future use.

RESULTS: Session content, 6-week sequence, and occupational therapy interventions were developed utilizing an online journal club format. Topics included: Client Factors of Values and Spirituality, Client Factors of Activities of Daily Living and Instrumental Activities of Daily Living, Individual Contexts and Environments, Client Performance Patterns of Routines and Habits, Client Occupations of Rest and Sleep, and Client Occupations of Leisure and Social Participation.

DISCUSSION: Prudent research of post-deployment effects and evidenced-based, theoretically sound occupational therapy approaches provided the premise and constructs of the online journal club progression from idea to actual potential program. The unprecedented effects of the COVID-19 pandemic have also served to promote the use of this platform and promote the therapeutic value of this occupational therapy program to address the adverse effects of deployment for future implementation and research.

1:15 - 1:30 p.m.

DEVELOPMENT OF A RECIPROCAL WALKER: OCCUPATIONAL PERFORMANCE AND MOBILITY

Authors: Hayley Dale & Jasmine Whitby
Mentor: Dr. Cindy Erb

BACKGROUND: Stroke is the leading cause of disability in the world today. Individuals who live with stroke present with multimodal deficits involving motor and sensory integrative skills which impact occupational performance and functioning. Impaired alignment, balance, and coordination alters mobility and increases the risk for falls. Current walking aids actually promote abnormal gait patterns through compensation, imbalance, and asymmetrical movements (Allet, et al., 2009).

Encouraging symmetrical alignment with dynamic weight bearing within the design and mechanisms of this reciprocal walker will facilitate tone modulation and fluidity of movement, increasing awareness and function of the neglected/affected side of the body or extremity (O'Sullivan, Schmitz, & Fulk, 2014). Variable hand grasp with tactile cues to increase sensory responsiveness, grip strength, and overall hand function will also be incorporated into the design of the walker.

PURPOSE: Based on theoretical and evidenced-based treatment approaches, the intent of this project was to develop a reciprocal walker prototype that would facilitate smooth, fluid reciprocal movement, alignment, and stability following neurological insult.
METHODS: Following extensive literature review, research, and clinical considerations the need for a reciprocal walker was identified and further developed through collaboration between MU OTD and senior engineering students. A Pugh Chart was used to identify metrics ranging from safety, cost, weight, and stability to develop several reciprocal walker prototypes which also addressed the needs of recovering stroke clients. Three different designs were comparatively benchmarked with standard walkers and using a V-model product design a prototype was developed.

RESULTS: Utilizing the design system of rotating levers seemed to effectively mimic the reciprocal relationship between the arms and legs during reciprocal gait and allowed for fluidity of movement and stability with optimal weight-bearing and postural alignment for individuals with neurological deficits.

DISCUSSION AND LIMITATIONS: The reciprocal walker was conceptualized from clinical experience, neuro rehab evidenced-based outcomes, and continued observation of preventable stroke effects on movement initiation and mobility. Preemptive design and fabrication potential was realized, but COVID-19 restrictions and inability to access 3D programming limited collaboration opportunities and the actual development of a reciprocal walker protoype.

CONCLUSION: Further development/manufacturing and concurrent research will affirm its theoretical premise and clinical effectiveness for future client use/safety.

1:30 - 1:45 p.m.

THE EFFECT OF GRIEF ON OLDER ADULTS AND OCCUPATIONAL ENGAGEMENT: A SURVEY

Authors: Maria Petrella
Mentor: Dr. Cindy Erb

BACKGROUND: Older adults experience a variety of life stressors, such as physical, cognitive, and environmental changes. The aim of this study is to identify the life events older adults face that cause feelings of grief, analyze what occupations they are currently participating in following the grief-inducing event, and explore how their needs can form a productive intergenerational program.

METHODS: A descriptive, web-based survey was designed and administered to adults over the age of 65 in order to identify what life events they have experienced that cause grief and what activities they are currently participating in to combat feelings of grief. Likert-scale questions were given in order to assess if adults would desire participating in programs with young children.

RESULTS: Results of the survey showed that the older adults experience a variety of life events that provoke feelings of grief, with death of a close friend being the main grief-causing event, followed by a change in physical and mental abilities. There was no significant difference between responses in regards to if the participants wished there were more activities offered to them, especially those involving young children.

DISCUSSION: While this study found that older adults experiencing grief might benefit from a type of individualized programming, future research is needed to explore the benefit of intergenerational programs for this population.

1:45 - 2 p.m.

MOMMY TRIBE: THE BENEFITS OF AN OCCUPATIONAL THERAPY LED SUPPORT GROUP FOR MATERNAL HEALTH AND WELL-BEING

Author: Yeniby Fernandez & Stephanie Rodriguez
Mentor: Dr. Dana Kolbfleisch

BACKGROUND: Maternal health consists of physical, mental, and social-emotional well-being and is impacted by maternal mental health disorders, physical health dysfunction, occupational imbalance and difficulties occurring during meaningful everyday tasks that occur in the perinatal period. Research suggests that there is a vital need for the implementation of educational strategies and social support to increase the quality of life and satisfaction of mothers in the perinatal period. The objective of this study was to develop an occupational therapy based social support group in order to improve the overall health and well-being of participants.

METHODS: The study design focused on elements of program development and feasibility. Participants: female, 21-35 years old, 2nd trimester- 6 months postpartum, English or Spanish speaking with access to transportation. Mothers with vision or hearing impairments, mothers with a history of substance abuse, and mothers of multiples were excluded from the study due to exposure to additional stressors. Final outcome: Researchers found that developing a program consists of many extenuating factors such as time, marketing, recruitment strategies, time commitment to attend, and involvement in the community.

DISCUSSION: The main findings of this study reveal the complexity and multi-dimensional nature of a support group for women in the perinatal period. Development of an occupational therapy support group has the potential to create future opportunities to address maternal care during the perinatal period. To establish a support group, occupational therapists can conduct in-services, community events, increase funding, and establish partnership within the community. Implications for occupational therapy practice: Advocacy of occupational therapy in maternal care is needed; health promotion and community-based practices can be implemented by occupational therapists; future researchers should pursue further funding for development of occupational therapy-based maternal social support groups.

CONCLUSION: Currently there is a lack of comprehensive care provided to women that involves occupational therapy during the perinatal period. Consideration of personal and temporal factors, participants, recruitment, and incentives should be further explored for the development of an occupational therapy maternal social support group.

2:30 - 2:45 p.m.

INVESTIGATING THE ROLE OF OCCUPATIONAL THERAPY IN THE CENTERING PREGNANCY PROGRAM ON FORT BRAGG

Authors: Sara Kooken
Mentor: Dr. Dana Kolbfleisch

INTRODUCTION: The United States has one of the highest maternal mortality rates in the developed world. Many women experience adverse physical and mental health conditions during the perinatal period. Occupational therapy intervention is an appropriate fit in perinatal health care as occupational therapists are equipped with skills in health promotion, occupational role management, and physical rehabilitation.

METHODS: This study was a pretest-posttest design investigating the role of occupational therapy in prenatal care. A convenience sample of women who were civilian and active duty military were recruited for this study and screened for postpartum depression using the Edinburgh Postpartum Depression Scale. Participants were provided with educational materials and presentations regarding pregnancy and postpartum topics. Participants were asked about perceptions on support, preparedness for motherhood, and knowledge of community resources.

RESULTS: Civilian participants scored better on relationship and well-being portions while those who were active duty had higher scores for personal health. Both groups felt comfortable with availability of social support, knowledge of community resources, and preparedness. Post-intervention data were unable to be obtained because of discontinuation of the Centering Pregnancy Program due to COVID-19.

DISCUSSION: Despite the discontinuation of the program, the researcher had positive feedback from both participants and other healthcare professionals that ran the group stating the information fit in well with the philosophy of the program. Our results show that allied health professionals should advocate for the inclusion of occupational therapy intervention as part of a holistic approach to women's health, and specifically in perinatal health.

CONCLUSIONS: More research is needed on the specific role of occupational therapy in women's health. Occupational therapists should be a standard profession included in women's health.

2:45 - 3 p.m.

A LOOK AT GENDER DIFFERENCES IN STRESS AND THE EFFECTS OF PERCEIVED BURNOUT ON ACADEMIC PERFORMANCE OF HEALTH PROFESSIONAL GRADUATE STUDENTS

Authors: Leiali'i Edwards
Mentor: Dr. Dana Kolbfleisch & Dr. Amy Spence

INTRODUCTION: The purpose of this study is to examine whether males and females report differences in stress levels and perceived burnout in graduate school. Research has demonstrated how stress and burnout are related in students decreased satisfaction with educational experiences (Zeman & Harvison, 2017) and poor academic performance (Sohail, 2013). The study seeks to examine the effects that stress, and perceived burnout have on the academic performance and professional student satisfaction of health professional graduate students.

METHODS: Participants (N = 6) where recruited via email from Methodist University College of Health Sciences & Human Services. The participants took a series of four surveys throughout the spring 2020 semester which included the following instruments: Demographic Questionnaire, Professional Quality of Life Scale (PSS), Perceived Stress Scale (ProQOL), and the Student Satisfaction Survey (SS).

RESULTS: A mixed measures ANOVA found no significant change in perceived stress or burnout across the four different periods and no significant change in student satisfaction with academic program nor academic performance. However, between-subject's analysis demonstrated a significant difference in student satisfaction for each gender. A small negative correlation was also found between perceived stress and student satisfaction, with high levels of perceived stress associated with lower levels of student satisfaction.

DISCUSSION: The results of this study will assist with the future development and implementation of a program that helps to combat the effects of stress and burnout specifically for health professional graduate students.

3 - 3:15 p.m.

OCCUPATIONAL BALANCE: A STUDY OF THE RELATIONSHIP BETWEEN QUALITY OF LIFE AND PERCEIVED STRESS, COPING STRATEGY AWARENESS, AND MENTAL HEALTH EDUCATION IN FIRST-YEAR OTD GRADUATE STUDENTS

Authors: Kaitlyn Futrell & Tashara Reid
Mentor: Dr. Dana Kolbfleisch & Dr. Amy Spence

BACKGROUND: Stress can affect all college students similarly, however the significant effects that stress may have on graduate students in health science programs are of particular interest (Rizzolo et al, 2009). The purpose of this study is to determine the effects of a coping strategy and mental health educational session on occupational therapy doctoral (OTD) students' perceived stress and use of stress reduction strategies.

METHODS: The cross-sectional mixed-method survey included convenience sampling of first year OTD students at Methodist University (n = 32) during their first didactic semester. Students participated in a 60-minute educational session. They were evaluated on perceived stress levels via the Perceived Stress Scale (PSS), quality of life (QOL) via the WHO Quality of Life - BREF questionnaire (WHOQOL-BREF), as well as knowledge of on-campus and general evidence-based stress reduction resources, knowledge of OT-based stress reduction strategies, knowledge of mental health stigma, and level of strategy utilization via the OTD Student Coping Strategy questionnaires (OTDSC). OTDSC questionnaires measure knowledge of coping strategies, mental health stigma awareness, and currently utilized strategies. Students were invited to attend an 8-week program to build upon coping strategies introduced during in-service education. The program was created in collaboration with on-campus counseling services. Topics include time-management, goal-setting, and occupational balance skills. The basis for the in-service educational session is a model for targeted-services intervention strategies for at-risk groups, developed by the American Association for Occupational Therapy.

RESULTS: Participant identifiers were not retrieved; thus, data was collected anonymously. Researchers were unable to compare questionnaire findings to coping strategy participation. Without identifiers, researchers were unable to determine participant strategies or in-service efficacy. Descriptive statistics indicate above-average PSS and WHOQOL-BREF scores.

DISCUSSION: The implications of this study support the need to investigate further coping strategy curriculum for OTD students to improve their QOL and perceived stress.

3:15 - 3:30 p.m.

A STRESS MANAGEMENT PROGRAM FOR GRADUATE HEALTH PROFESSIONAL PROGRAMS TO REDUCE STRESS OVERALL

Author: Caitlin Ponko
Mentor: Dr. Dana Kolbfleisch & Dr. Amy Spence

BACKGROUND: Stress is an inevitable aspect of any college student's life and comes in many forms. For graduate health professional students, high levels of stress are experienced such as high caseloads, time pressure, treatment failures and more. It is important to understand a student's stress so they can learn how to cope and manage prior to entering their professional careers. The goal of this study was to investigate an online stress management program as an effective resource across all graduate health professional programs to decrease stress and anxiety levels.

METHODS: Seventeen graduate health professional students participated in a self-paced online stress management program, "Coping with Stress"; which took place for approximately 20-30 minutes once a week for 4-6 weeks. A stress and anxiety informal survey were administered prior to and at the completion of the online stress management program using Microsoft Excel.

RESULTS: Results were broken down into two categories, (1) perceived stress and (2) depression and anxiety. Concerning perceived stress, the most significant decreases were reported within the question relating to coping with all the things the student had to do. In the category of depression and anxiety the most significant decreases were reported within feeling loss of interest in about everything and feeling of can't experience any positive feeling.

DISCUSSION: The results for the effectiveness of "Coping with Stress" program support previous research in reducing stress levels for graduate health professional students.

CONCLUSION: An online stress management program is to be effective in reducing stress levels for graduate health professional students.

3:30 - 3:45 p.m.

DISTINGUISHING OCCUPATIONAL THERAPY'S CURRENT ROLE IN SECONDARY EDUCATION AND IMPROVEMENTS NEEDED FOR SUCCESSFUL TRANSITION INTO ADULTHOOD FOR STUDENTS WITH DISABILITIES

Author: Ashley Ammann & Lillian John
Mentor: Dr. Amy Spence

BACKGROUND: Based on prior research, occupational therapy practitioners' (OTPs) working in the school setting have not demonstrated their distinct value in post-secondary transition services for adolescents with disabilities. Therefore, the purpose of the study was to determine the level of OTP involvement in transition programming, types of transition services currently being provided to high-school aged adolescents with disabilities, and secondary educators and parents/caregivers' satisfaction with current transition programming across the state of North Carolina.

METHODS: A cross-sectional study design using non-standardized survey methodology was created to assess the perspective, satisfaction, and knowledge on transition planning across stakeholders in North Carolina. Descriptive statistics were used to analyze survey data.

RESULTS: A total of 39 participants were included in this study-32 school-based OTPs, 6 secondary educators, and 1 caregiver. Results revealed school-based OTPs involvement in post-secondary transition programming is minimal and school-based OTPs are not actively advocating for themselves to be involved in post-secondary transition programming.

DISCUSSION: OTPs have the knowledge and expertise to assist adolescents in achieving their post-secondary transition goals, yet little effort to provide services to adolescents has occurred. A lack of knowledge on OTPs' role on post-secondary transition teams and transition laws has been identified, which limits advocacy for OT involvement on transition teams.

CONCLUSION: Results from this study indicate school-based OTPs are not demonstrating their distinct value in post-secondary transition services. Therefore, there is a need to educate school-based OTPs, secondary educators, and caregivers of transition-aged adolescents with disabilities on the role school-based OTPs have and the importance of advocacy for their participation on post-secondary transition teams and programming. By educating these individuals we can facilitate the pursuit of greater independence and participation in daily occupations post-graduation for high-school aged adolescents with a disability.

3:45 - 4 p.m.

IDENTIFYING PERSPECTIVES OF ADOLESCENTS DIAGNOSED WITH CANCER TO PROMOTE OCCUPATIONAL THERAPY'S ROLE AND PARTICIPATION IN THEIR HOMES, SCHOOLS, AND COMMUNITIES

Author: Kylie Arp
Mentor: Dr. Amy Spence

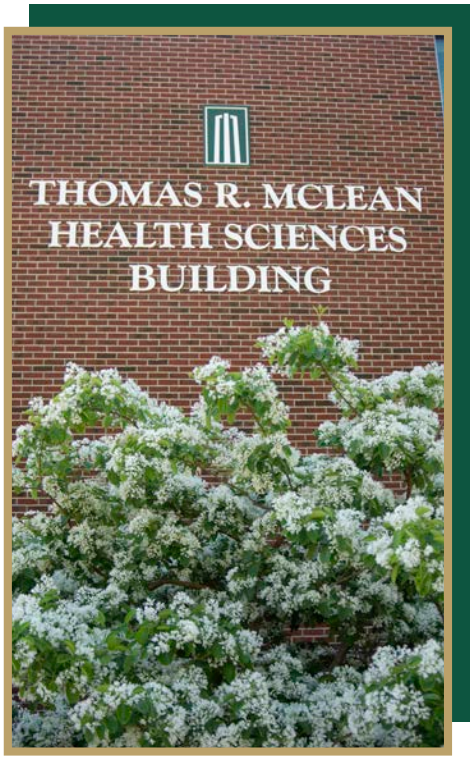
BACKGROUND: Adolescents with cancer have unique physical, developmental, and social needs. Occupational therapy (OT) is the profession whose distinct value focuses on assisting clients of all ages to participate in occupations. Yet, there is limited research on OT's provision of services to adolescents with cancer.

METHODS: This pilot study is a quasi-experimental design with two comparison groups. The total number of participants was ten. Five adolescents aged 13-19 with a cancer diagnosis comprised the experimental group. Five adolescents aged 13-19 without cancer comprised the control group. A qualitative semi-structured interview was used to gather open-ended adolescent perspectives and the Child and Adolescent Scale of Participation (CASP-Y) was used to assess participation.

RESULTS: A Mann-Whitney U test indicated no significant difference between the two groups according to the CASP-Y ($p = 0.07$). The semi-structured interviews were analyzed into case studies and used to identify the need for OT among adolescents with cancer.

DISCUSSION: An insignificant p-value was related to a small sample size. The majority of participants indicated that participation is limited during and after cancer-related medical treatments. Interview results also indicated that OT could assist adolescents with cancer in addressing their participation in meaningful occupations. Further research is needed to fully determine how OT can meet the occupation and participation needs of adolescents with cancer.

CONCLUSION: Despite conflicting quantitative results, qualitative findings reveal that OT's role is necessary and vital in the treatment and recovery of adolescents with cancer.



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