



THE HERBERT H. &  
GRACE A. DOW COLLEGE OF

# **HEALTH PROFESSIONS**

CENTRAL MICHIGAN UNIVERSITY

## **4th Annual Research Symposium**

*April 13, 2021*

Presentations will occur virtually  
between 3 - 5 p.m. via Webex:  
<https://cmich.webex.com/meet/ustin1k>

# Welcome



On behalf of the Research Committee, we would like to welcome you to The Herbert H. and Grace A. Dow College of Health Professions 4th Annual Research Symposium. A special thank you to Gary and Barb Anderson Russell for their generous sponsorship and support of our research symposium. At this unprecedented time, impacted by COVID-19, we are proud to share an opportunity to learn more about the health care research conducted by our internationally known scientists, clinicians, academicians, and young researchers. The research they have been conducting is important!

Sincerely,

Ksenia I. Ustinova Ph.D.  
Chair, The Herbert H. and Grace A.  
Dow College of Health Professions  
Research Committee

Thomas J. Masterson, Jr. Ph.D.  
Dean, The Herbert H. and Grace A.  
Dow College of Health Professions

# Our Sponsors



Gary and Barb met on their first day of attending CMU where between them they have earned four degrees and obtained a lifetime of Chippewa pride. They taught for several years in the Alma Public Schools until Gary was called to Washington by another Central alum, U.S. Senator Bob Griffin, to work in the Senate. Gary later served as Chief of Staff for two other senators and as a Senior Policy Advisor at the U.S. Department of State. Barb was a Kindergarten teacher in Alma, as well as at schools in the Fairfax County (Virginia) Public Schools, where for the second half of her career she was an elementary school librarian. They reside near Mt. Vernon within two miles of their four grandchildren and their parents. Gary and Barb are excited to support the Health Professions Research Symposium, which they see as “providing an educational trifecta—learning by doing, producing information, products, and procedures in a vital area, and providing an effective avenue to get them to those who can put them to use.”

Gary Russell B.A., M.A.

Barb Russell B.S. in Ed, M.A.

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**2021  
Research  
Symposium  
Abstracts**

# EXERCISE AND HEALTH SCIENCES

## Exercise and Health Sciences

Presenters – Kellie N. Hoehing, Kadeeja S. Murrell, Rowan A. Fitzpatrick, Micah N. Zuhl Ph.D., and Rachael K. Nelson Ph.D.

### Impact of wearing a face mask on peak values obtained from a graded exercise test: a preliminary analysis

Graded exercise testing (GXT) is a fundamental component of the diagnosis and treatment of patients with suspected/known cardiovascular disease (CVD). Currently in the middle of a global pandemic, the CDC recommends all patients wear a facemask when receiving health care, (including during GXTs) to reduce transmission of COVID-19. However, the impact of wearing a face mask on data collected during a GXT has not been evaluated in individuals at risk of developing CVD. **PURPOSE:** To examine potential differences in major outcome measures derived from a GXT between facemask use vs. disuse among moderate risk adults. **METHODS:** Using a crossover study design, 3 lean ( $20.7 \pm 0.9$  kg/m<sup>2</sup>), adult ( $58.0 \pm 2.4$  years), regularly active, females classified as “moderate” risk for the development of CVD based on age, participated in two nearly identical experimental trials. Participants were randomized to one of two experimental conditions (i.e., wear a facemask that covered their mouth and nose vs. no facemask) during a treadmill GXT using the Modified Bruce Protocol during their first experimental trial. The second experimental trial was identical except participants completed the GXT under opposite conditions from their first trial (i.e., facemask vs. no facemask). Peak heart rate (HR), systolic blood pressure (SBP), and rating of perceived exertion (RPE) were collected during the final completed stage of each GXT. Peak HR was used to calculate percent predicted maximum heart rate achieved during each GXT. Peak HR and SBP were used to calculate peak Rate Pressure Product (peak RPP = peak HR x peak SBP). Treadmill speed and grade during the last completed stage of each GXT were used to estimate maximal oxygen consumption ( $VO_{2peak}$ ) and used to calculate functional capacity ( $FC = VO_{2peak}/3.5$ ). Peak values were compared between conditions. **RESULTS:** Comparing facemask disuse vs. facemask use, in this preliminary analysis we did not detect significant differences in peak SBP ( $167.3 \pm 6.4$  mmHg vs.  $171.3 \pm 1.2$ ,  $p=0.44$ ), RPP ( $28,334 \pm 1200$  vs.  $27,696 \pm 522$ ,  $p=0.37$ ), or peak RPE ( $18.7 \pm 0.6$  vs.  $18.3 \pm 1.1$ ,  $p=0.42$ ). However, peak speed ( $4.5 \pm 0.5$  vs.  $3.9 \pm 0.5$  mph,  $p=0.18$ ), grade ( $16.7 \pm 1.1$  vs.  $15.3 \pm 1.1$ ,  $p=0.18$ ), estimated  $VO_2$  peak ( $41.7 \pm 5.8$  vs.  $51.5 \pm 7.7$  ml/kg/min.,  $p=0.20$ ), estimated METs ( $14.7 \pm 2.2$  vs.  $11.9 \pm 1.7$   $p=0.20$ ), exercise time ( $19:01 \pm 0.05$  vs.  $17:53 \pm 0.08$   $p=0.14$ ), and peak heart rate ( $169 \pm 3$  bpm vs.  $162 \pm 4$   $p=0.18$ ) tended to be higher under no facemask vs. facemask conditions. **DISCUSSION:** These preliminary findings suggest that facemask use during a GXT could result in lower peak values, translating to less effective clinical care of patients with known or suspected CVD.

# Exercise and Health Sciences

Presenters – Tyeisha R. Fuller, Jacob Kubinski, Jennifer K. Sansom, PT, Ph.D.

## The Effects of Muscle Weakness on Gait Deviations in Duchenne Muscular Dystrophy: A Systematic Review

**Background:** Duchenne Muscular Dystrophy (DMD) is a degenerative neuromuscular condition affecting 1 in 3500 male children that results in loss of muscular strength and motor function. Gradual alterations in gait occur until walking ability is eventually lost. Research has proposed that the loss in walking ability is due to a progressive loss of motor function contributing to decreased muscle strength. However, the evidence examining the role of progressive loss in motor function on changes in overt gait characteristics has not been summarized.

**Objective:** This aim of this review of the literature was to summarize and critically appraise the existing evidence related to muscle activation patterns and overt gait characteristics for young children with DMD who were still able to walk independently.

**Methods:** We conducted a systematic literature search in 5 electronic databases. The research articles identified were evaluated on the basis of the following inclusion criteria: (1) the text was written in English; (2) population(s) was 3-18 years old; (3) population was clinically diagnosed with DMD; (4) gait parameters were quantitatively described; (5) a typically developing (TD) control group was included or a longitudinal study design for children with DMD; and (6) all participants were able to walk independently. The Newcastle-Ottawa Quality Assessment Scale (NOS) for case-control studies was used to assess the quality of each included study.

**Results:** Thirty-seven articles examining independent walking patterns and/or muscle activation patterns during functional movements were initially identified from the search of the databases. From these, only eight were included in the analysis. Studies achieved NOS scores ranging from 6-8, five of which were considered good, 1 fair, and 2 poor.

**Conclusion:** The current evidence linking changes in muscle strength with the appearance of abnormal gait alterations remain inconclusive. Further research studies examining muscle activation patterns during performance and functional tasks are needed. Additionally, there is a need of studies examining changes in muscle activation patterns and overt gait characteristics from the onset of independent walking to the cessation of walking ability. Both will provide important insights to therapists for development of interventional programs.



# Exercise and Health Sciences

Presenters – Olivia Riley B.S., Alexis Pearce, and Roop Jayaraman Ph.D.

## Fit 4 Us: A Healthy Lifestyle Program for Families

Childhood obesity causes several co-morbidities and negative psychological effects. BMI and abdominal subcutaneous fat mass correlate well from early childhood to adulthood, indicating a strong connection between childhood and adulthood obesity. Children who remain obese as adolescents have a greater chance of becoming obese adults, with overweight teenagers having an 86% chance of becoming obese adults compared to a 67% chance for an obese child. (Rundle et al, 2020). Therefore, it is important to intervene by the pre-teen years. The city of Mount Pleasant reported a teen obesity rate of 32.3%, which is well above the national rate of 27.7% (Community Health Assessment, 2019). To date there is no community wide program in the Mount Pleasant area to combat the rising pre-teen and teen obesity rate.

Numerous studies have investigated different intervention strategies to combat rising obesity rates in pre-teens. The purpose of our project was to review the current obesity literature to identify the intervention strategies best suited for pre-teens. A review of the obesity literature revealed that while there is no gold standard intervention program to effectively combat the rising pre-teen obesity rate, a community-based program has been reported to be effective with the pre-teen population. A systematic review of the obesity literature identified the following four factors as critical in the effectiveness of community-based intervention program, (1) nutrition education, (2) behavior modification, (3) physical activity, (4) opportunity to practice behavior modification. Based on the literature, the pedagogy that has been most successful in reducing BMI in pre-teens utilizes a combination of parent and child education, with ample opportunity for practice. Each of the four program components involved an educational component focusing on health behaviors, and an activity module with hands-on practice for parents and children to reinforce the new health behavior.

Our research-based 12-week community-based program will educate children and their parents/guardians on lifestyle choices and behaviors to support a healthy weight, in the Mount Pleasant area. Our program called “Fit 4 Us” is divided into four educational domains: nutrition education, nutrition behavior modification, practicing the behavior modifications, and increasing physical activity. The activities included in each educational unit was based on our findings from the systematic review with a special focus on the pre-teen age group. Each educational component in our program offers 2-4 hands on activities reported in the obesity literature as effective measures to improve health behaviors and outcomes. The Fit 4 Us program will be offered to local pediatricians’ offices as an option to refer children and families concerned about bodyweight and health behaviors.

# Exercise and Health Sciences

Presenters – Joesi Krieger, Nick McCann, Markaela Witczak, and Micah Zuhl Ph.D.

## Exercise Progression Techniques for CVD Patients Enrolled in Cardiac Rehabilitation Clinics Throughout the United States

**Background:** Cardiac rehabilitation (CR) is a comprehensive treatment designed to restore and maintain physical function, along with psychological and vocational status, among cardiovascular disease patients. Supervised aerobic exercise is a primary component, and patients are commonly prescribed 36 sessions over a 12-week period. Guidelines recommend that patients perform moderate to vigorous intensity exercise for 40-60 minutes on three days per week. However, there is a lack of information detailing where to begin a patient's exercise program and how to progress patients toward achieving recommended exercise goals.

**Purpose:** The purpose of this study was to identify current practices for prescribing initial exercise and techniques for progressing patients enrolled in CR clinics throughout the US. **Methods.** An anonymous survey was completed by clinicians at 93 CR clinics throughout the US. The survey included: clinic characteristics (location, certification requirements, entry testing information); exercise prescription practices (initial exercise intensity and duration goals); and exercise progression techniques (indicators used to progress patients, progression off telemetry).

**Results:** All four regions of the US were represented with 16%, 32%, 20%, and 33% of responses from the Northeast, Midwest, West, and South, respectively. Forty-five percent of the sampled clinics were from rural US areas with the remaining from either urban or suburban settings. Baseline peak functional capacity testing was completed by 54% of clinics and 31% used peak MET estimation questionnaires prior to initial exercise session. Exercise intensity was progressed by monitoring RPE for several sessions (62%), if the patient was hemodynamically stable (26%), or systematically based on number of sessions completed (12%). Patients were also progressed off telemetry in 36% of clinics.

**Conclusions:** There is considerable variability in CR clinic intake procedures across the US. The initial exercise session may or may not be preceded by baseline peak functional capacity testing or estimation questionnaires. This survey study highlights the emphasis that CR clinics place on RPE when progressing patients through their exercise program. These data will assist researchers in developing future studies to evaluate the effectiveness of exercise prescription and progression techniques.

# Exercise and Health Sciences

Presenters – Markaela Witczak, Kellie Hoehing, Rachael Nelson Ph.D., Micah Zuhl Ph.D.

## Effect of type 2 diabetes co-morbidity on functional capacity changes among CVD patients enrolled in cardiac rehabilitation: a meta-analysis

**Introduction:** An increasing number of patients in cardiac rehabilitation (CR) programs present with additional co-morbidities including type 2 diabetes (T2DM). Estimates indicate that up to 44% of CR patients also have T2DM. However, a general understanding of the impact of diabetes as a co-morbidity to CVD on changes in functional capacity in response to CR remains unclear. Therefore, the purpose of this meta-analysis is to determine the impact of CR on changes in functional capacity among patients with CVD and a type 2 diabetes co-morbidity.

**Methods:** A systematic review and meta-analysis of randomized control trials were completed using PubMed, CINAHL, and Web of Science in January 2021. Articles were included if they compared cardiac rehabilitation patients with T2DM to those without. The primary outcome variable was functional capacity change from pre to post CR reported as maximal or peak oxygen consumption (VO<sub>2</sub>max, VO<sub>2</sub>peak), and peak metabolic equivalent (METs). A random-effects model sub-group meta-analysis was conducted. A diabetes co-morbidity was selected for the subgroup analysis with CVD patients being reported with T2DM or without (non-T2DM). Weighted mean differences with 95% confidence intervals (95% CIs) between pre- and post- cardiac rehabilitation on functional capacity among both T2DM and non-T2DM sub-groups were divided by pooled standard deviation. Hedges's g were used to evaluate the magnitude of the overall effect size with weighted mean differences of small (0.2 to 0.5), moderate (0.5 to 0.8), and large (> 0.8). Covariates included, age, gender, duration of the CR program (in weeks), and type of CVD (coronary artery disease, peripheral artery disease, heart failure, valve disease).

**Results:** Twelve studies with total sample of 15,606 patients were extracted. Average change in peak METs was 1.41 1.76 among non-T2DM and 1.08 1.57 among T2DM patients after cardiac rehabilitation. The change in functional capacity was significantly lower among T2DM patients (Z-value = 2.14; g = -0.42; 95% CI [-0.86 - 0.01]; p = 0.03). Covariates did not influence outcomes.

**Conclusion:** The review confirms that while CVD patients with T2DM experience changes in functional capacity in response to cardiac rehabilitation, the changes are smaller compared to those with CVD alone. This means that more research into the mechanisms of T2DM of functional capacity changes could alter cardiac rehabilitation programs for these patients.

# Exercise and Health Sciences

Presenters – Nicholas K. McCann B.S., Jeffrey E. Edwards Ph.D.

## **Efficacy of Unconventional Cardiac Rehabilitation Modalities in the 6-county area: A Review of Literature Pertaining to At Home Based Cardiac Rehabilitation**

Cardiovascular disease is the leading cause of death in America. Cardiac rehabilitation (CR) has been shown to positively impact health risk factors on chronic disease and total mortality rate. One of the biggest issues currently facing CR is the low rates of referral acceptance. At Home Based Cardiac Rehabilitation programs (AHBCR) offer a solution to patient participation by increasing access to care. Therefore, AHBCR also has the potential to negate many barriers to participation that are often reported such as geographic location, transport, employment status, cost of care, and patient health status.

**Objective:** This review aims to identify, curate, and summarize the primary characteristics of AHBCR. The review examines the five core components of CR (patient assessment, exercise training, dietary counseling, risk factor management, and psychosocial intervention) and identifies common barriers to CR that are negated or may be created by AHBCR. It also evaluates adherence and acceptance to AHBCR and summarizes potential cost of care benefits, includes patient and caretaker testimonials, describes implementation of AHBCR in hospital systems, and common technologies and materials utilized in AHBCR.

**Methods:** The researcher carried out a literature search on databases including but not limited to Pubmed, Elsevier, the Journal of Cardiovascular and Pulmonary Rehabilitation, and the Cochrane library. A combination of search terms used included “Telehealth”, “Cardiac Rehabilitation”, “Rural”, “Remote”, “At Home Cardiac Rehabilitation”, “Barriers to Cardiac Rehabilitation”, “Cost of Care”, “Adherence”, “Referral acceptance”. Due to the wide range of characteristics pertaining to the subject, reviewed literature deemed appropriate to include was based on the relevancy to the subject matter. The researcher attempted to include the most recent literature pertaining to characteristics reviewed, although some sources included data obtained from older studies.

**Results:** The literature strongly suggests that AHBCR is as effective as CBCR at improving modifiable risk factors associated with cardiovascular cause mortality. Additional benefits obtained in AHBCR will be dependent on program architecture. Additional benefits, which include, increased program adherence, greater changes in long term behavior, increased outcome in quality of life, and less overall cost of care will similarly be affected.

**Conclusion:** AHBCR is an equitable alternative to traditional CBCR because it effectively modifies core components to a similar degree. Potential Barriers that may arise in rural areas are access to technologies and internet necessary for an AHBCR program to facilitate optimal patient progression.

# Exercise and Health Sciences

Presenters – Quinn J. Keilen and Naveen Sharma, Ph.D.

## Implementing a SOMIfit Program in Mid-Michigan

The Special Olympics Michigan fit (SOMIfit) program is a 12-week program designed by Special Olympics Michigan to improve the health, fitness, and wellness of Special Olympics athletes. For one hour each week, a Central Michigan University Exercise Science student led Special Olympics athletes in completing a training session targeted for individuals with intellectual disabilities. These sessions were designed to improve an athletes' muscular flexibility and strength, endurance, and cardiovascular health. Each week, a session consisted of approximately 5-10 minutes of stretching, 30-40 minutes of circuit training, and 10-15 minutes of health education. Evaluation of the training program was assessed by comparing the athlete's results between pre- and post-program testing. These tests included number of sit-ups performed in two minutes, number of push-ups performed in two minutes, amount of time spent performing a wall sit, inches reached in a sit-and-reach test, and number of miles ran in a pacer test, inches between fingertips in a shoulder stretch. The health education topics covered in the program included creating and managing personal goals, as well as learning and practicing proper hygiene. The first three 12-week programs conducted at mid-Michigan locations were found to be beneficial for athletes based on our data and qualitative responses from the athletes. Further analysis of this program helped identify programmatic limitations and areas improvements that should lead to enhanced athlete outcomes and outreach that should sustain SOMIfit in the community for future years.

# SCHOOL OF REHABILITATION AND MEDICAL SCIENCES

## **RN-to-BSN**

Presenters – Kechi Iheduru-Anderson DNP, RN, CNE, CWCN, Gwinong Olumayowa Chollo

### **The experience of Black African International Graduate Students at a Predominantly White Midwest University**

Background: The United States (US) has a history of enslavement of Africans that ended over a century ago, yet racism against black people, especially Africans, has persisted throughout US workplace and educational settings. This persistence has been attributed to structural racism entrenched in society through the concept of whiteness, which gives rise to a system of thinking called colorblind ideology. Whiteness and colorblind ideology serve to suppress the discussion of race and racism and promote the idea that racism exists in the US only in past history. Colorblind ideology also affords a script that provides rationalizations used by those perceived as white to explain away racism and keep it hidden. Whiteness and colorblind ideology have been hypothesized to lead to experiences of discrimination by both non-white and international students in US higher education settings. The Midwestern US has been a target of studies of racism connected to whiteness in higher education due to the large white population in this area.

Purpose: The purpose of this study is to better understand both structural and overt racism perceived by Black African International Graduate Students (BAIGS) at a predominantly white Midwest US university, and what they would recommend to reduce any perceived racism in their graduate program and at the university.

Method: The study used a qualitative descriptive design to explore how Black African International Graduate Students described their experiences in a predominantly white university in the Midwest US. Purposive sampling augmented with snowball sampling was used to recruit 11 qualified participants. 11 BAIGs were interviewed individually, and their transcripts were thematically analyzed.

Results: The findings are described under the following themes: Diverse but separate, “wanted but not welcomed,” “collective indifference,” American exclusionary classroom practices, and discriminatory campus employment practices. The BAIGS offered several recommendations that they felt can be used to address some of the findings from the study.

Conclusion: The study highlights some of the challenges often experienced by international students in the US already established in literature. These students come from countries that are racially homogenous, where race is not an identity marker or a social distinction. They have never been in the racial minority; therefore, it can be devastating to be suddenly viewed through a racial lens. United States higher education is highly racialized against international students. Institutional barriers, laws and social practices exclude international students, especially those from impoverished countries, implicitly or explicitly, on the basis of race. It is not enough that universities admit Black African international students, it is important that they ensure that the students have the university resources to be able to settle into the college life and are able to connect with the college community.

## **Athletic Training**

Presenters – Courtney Mundell AT, ATC, Blaine C. Long Ph.D., AT, ATC, Jennifer Popp Ph.D., AT, ATC

### **Low-Intensity Pulse Ultrasound and Pulsed Electromagnetic Field Devices on Fractures and Pain Perception: A Critically Appraised Topic**

**Context:** Fractures are a debilitating injury that result in pain and loss of function. These injuries can take weeks to heal and can limit the activity of an individual. Bone stimulators are devices that promote fracture healing by facilitating osteoblast activity, reducing osteoclast reabsorption, increasing rates of osteoid formation, and stimulating angiogenesis. Two commonly used bone growth stimulators are Low Intensity Pulsed Ultrasound (LIPUS) devices and Pulsed Electromagnetic Field (PEMF) devices.

**Objective:** The purpose of this critically appraised topic is to identify the effectiveness of bone growth stimulators for accelerating fracture healing and reducing pain perception.

**Methods:** A literature search was conducted in the fall of 2020. Electronic data bases utilized included SPORTDiscus, PubMed, Physiotherapy Evidence Database (PEDro), Cumulative Index to Nursing and Allied Health Literatures (CINAHL), and Google Scholar. The search terms included long bone fractures, low-intensity pulsed ultrasound (LIPUS), pulsed electromagnetic field bone stimulation (PEMF), accelerated bone growth, and decreased pain perception. Studies were included if they were performed on humans, included delayed union, nonunion, and acute fractures, LOE 2 or higher, conducted in the last 13 years, and written in English. Studies were excluded if the effect of variables such as smoking, nutrition, supplements, or age were the primary outcome measure, they included compound fractures, avulsion fractures, or participants with osteopathologies, animal subjects were used, or outcome measures included metabolic markers of bone growth.

**Results:** Four randomized control trials met the inclusion and exclusion criteria. The results showed that both LIPUS and PEMF were effective in fracture consolidation and pain reduction in delayed union and nonunion fractures. Neither device was showed to be effected in reducing pain or accelerating bone growth for acute fractures. Moderate compliance was shown in studies using PEMF devices due to long required treatment time. More research is needed to determine if either treatment is effective in patients with other types of fractures (e.g., stress fractures).

**Conclusion:** LIPUS and PEMF bone growth stimulators are an effective tool to help lower pain perception and accelerate fraction consolidation in patients with long bone delayed union and nonunion fractures, but additional research is needed to determine the effectiveness of these treatments on other types of fractures. LIPUS may be more feasible to use in an outpatient healthcare setting due to shorter treatment times.

# Doctor of Physical Therapy

Presenters – Jocelynn Venema and Jamie Haines PT, DScPT, NCS

## Serving Children with Communication Disorders: an Interprofessional Education Experience in Graduate Studies

**Introduction:** Students in the Health Professions who participate in interprofessional educational (IPE) events report improvements in communication, decision making, shared responsibility, and conflict resolution skills for clinical practice.<sup>1-4</sup> IPE between speech-language pathology (SLP) and Doctor of Physical Therapy (DPT) students has not been studied in depth. The purpose of this study was to evaluate student perceptions of an IPE experience with DPT and SLP students serving children with communication disorders during a summer camp.

**Subjects:** Second year DPT students (n=85) and SLP students (n=72) from Central Michigan University.

**Methods:** Pre- and Post-experience data was collected over student cohorts for two consecutive years using the Interprofessional Collaborative Competencies Attainment Survey (ICCAS). Repeated measure ANOVA using ICCAS scores. The constant comparative method was used to analyze DPT students written reflections post experience.

**Results:** Average scores of the ICCAS showed statistically significant improvement (p-value <.001) for students across disciplines and cohort years across all domains of the survey including communication, team functioning, and collaborative patient/family centered approach. There was no correlation between improved scores and prior student IPE experience or student opinions about IPE. DPT students cited advantages of collaboration for this project, and also linked benefits of collaborative practice to their own skills as a physical therapist and the physical therapy profession.

**Discussion:** IPE experiences that include SLP and DPT students are rare, however, this study showed significant improvements in perceived skills needed for effective interprofessional collaborations in clinical practice. DPT students reported an enhanced understanding and respect for the role the SLP discipline plays in rehabilitation. In addition, both student groups appreciated being able to use the collaboration to provide a valuable service to children in the local community.

**Conclusion:** This unique SLP/DPT IPE experience provided students opportunity to experience the value of collaboration and develop positive attitudes for future clinical practice. Providing similar types of learning activities in professional health care programs may improve student readiness for collaborative clinical practice after graduation.



# COMMUNICATION SCIENCES AND DISORDERS

## Speech-Language Pathology

Presenters – Nick Malendowski B.S., Katie A Strong Ph.D., CCC-SLP, Clarisse El-Khoury B.A., Jackie Hinckley Ph.D., CCC-SLP

### “Why didn’t I think of this before?” Perceptions of Stakeholder Engaged Research

Background: Research is often completed without collaboration with the group being researched, leading to a disconnect between communities and research outcomes that are meaningful and relevant to all stakeholders. Stakeholders are individuals taking part in research that are affected by the outcomes of the project. Collaborative research is also known as stakeholder engaged research and is the inclusion of stakeholders into the research process, not only as participants, but as active members in the execution of the project. As the use of stakeholder engaged research gained traction within many different fields, including healthcare, policy, and community health (Macquay, 2017), the terminology that is used to describe this approach varies between projects (Faridi et al., 2007). Project “Building Research Initiatives by Developing Group Effort”, or BRIDGE, was a conference held in October 2018 designed to connect persons with aphasia, families, clinicians, and researchers an effort to increase collaborative research between researchers and other stakeholder groups. When working with persons with communication disorders, this approach results in an increase in research relevance, higher rigor, minimized logistical issues, increased collaboration, and more empowerment to both researchers and stakeholders (Turnbull et al., 1998).

Study Aim: This poster explored the experience of researchers who participated in Project BRIDGE’s collaborative research training. Qualitative interviews were conducted to examine how views about collaborative research changed after completing the training and whether they plan to collaborate with other stakeholders in future research.

Method: Interviews were conducted with five researchers who participated in Project BRIDGE. Qualitative content analysis was used to examine interview data using Graneheim and Lundman’s (2003) approach. Interview transcripts were read closely, then separated into smaller meaning units. Once meaning units were established, the text was interpreted and separated into subthemes and themes.

Results: Four themes were derived from the data: new way of thinking, barriers, motivations, and role. Results provided insight to the experiences researchers had with collaborative research at the Project BRIDGE Conference and their likelihood of continuing to conduct participatory research with multi-group stakeholders. Results show that researchers were more likely to collaborate in research with other stakeholder groups after attending the Project BRIDGE conference.

Discussion: Participating in multi-stakeholder research training provides researchers an expanded view of collaboration for research projects that may be rewarding than traditional research involving other stakeholders as only participants in research studies. Training and ongoing supports are beneficial for researchers in the transition to this collaborative approach to research. Future studies might involve exploring viewpoint of other stakeholders’ experiences in similar or ongoing training experiences.

# Speech-Language Pathology

Presenters – Erin Hacker, AnnMarie Bates M.S., CCC-SLP

## **Proprioceptive Input and Sensory Spaces: How Adjusting Spaces on a University's Campus Can Produce a More Inclusive Environment**

This study analyzed the current knowledge of Central Michigan University (CMU) staff on the benefits of sensory spaces on college campuses. As noted by current research, implementing sensory spaces and proprioceptive materials into specific settings can benefit individuals with an array of sensory challenges and anxiety. The main benefit includes stimulating the senses to increase focus and relax the body. A virtual education tool demonstrating what sensory spaces were and providing examples of how to create these spaces was prepared. In addition to the education tool, pre- and post-surveys were created to measure the confidence level of CMU staff members to understand and create sensory spaces before and after viewing the educational tool. Staff members were chosen based off of their positions on campus and their accessibility to students. These materials were then sent out to 55 staff members across campus. It was hypothesized that the virtual education tool would educate CMU staff on the importance of sensory integration on college campuses and enable them to create sensory spaces in the future. Data from pre- and post-surveys were then compared and analyzed. The results of this study indicated significant improvement in the confidence level of CMU staff on their knowledge and their ability to create a sensory space. The qualitative data collected in this study suggest a growing need for staff education and the implementation of sensory spaces across universities such as CMU. Future research focusing on improving sensory experiences in a virtual format would be beneficial to the overall effectiveness of the virtual education tool. Overall, these results further demonstrate the need for educating university staff on the benefits of sensory spaces on college campuses and the implementation of such spaces in the future.

# Audiology

Presenters – Karlina Didion B.S., Yunfang Zheng Sc.D., M.D., CCC-A, and Nicole Ferguson Au.D., CCC-A

## **Comparisons of traditional and Otoscan ear impression techniques, earmold comfort, and audiology clinical implications**

This study investigated multiple clinical aspects between the traditional ear impression and Otoscan 3D scanning techniques. Aspects compared between the impression techniques included feelings of comfort and safety reported by participants undergoing each, perceived comfort of earmolds created, cost and time efficiency, and which option provided the best clinical outcomes for a special pediatric case. The traditional technique delivers a silicone material into the ear canal that is left to dry and be removed, while Otoscan utilizes 3D scanning to scan the ear. On two adult-group participants (experienced earmold users and nonusers) the two techniques were performed. A young audiology professional performed the techniques on the earmold nonusers while an experienced audiology professional performed them on the earmold users. Earmolds were made from each technique and were worn for a week each by the earmold users. A questionnaire was administered throughout the experiment regarding feelings of comfort and safety of each technique, initial fit and comfort of the earmolds, and overall comfort one week after earmold use. Parts of this questionnaire were filled out after each step which included after getting both ear impression methods taken, after wearing the first earmold set, and after wearing the second set. Earmold nonusers only filled out the portion regarding feelings of each technique. Results revealed Otoscan to be the preferred method by participants and displayed higher ratings in feelings of comfort and safety in comparison to the traditional technique. Audiology professionals also preferred implementing the Otoscan technique and felt they could better ensure safety to the patient while being more clinically efficient. Otoscan was more time efficient for clinics with it taking about half the time of traditional ear impressions. Otoscan also was shown to be more cost effective with a 7% less cost to create earmolds and a 50% lower shipping cost. Results of earmold wearing revealed similar perceived comfort from each technique by the earmold users. A special pediatric case was also reported with comparison of both techniques. Otoscan allowed for a deeper scan to be obtained safely and further create an earmold that has been successful in keeping the entire canal open to prevent conductive hearing loss caused by a skin disorder in the patient. This case provides a good example for future clinical application in choosing the appropriate technique for each individual patient to reach the best clinical outcome. In conclusion, these findings revealed Otoscan as the preferred impression technique by both patients and professionals. The implementation of Otoscan will increase clinic efficiency as the cost and time needed is decreased with Otoscan technology. With increasing involvement of new technology and more young professionals joining the profession of audiology, Otoscan would be a good addition for audiology practices everywhere.



# Health Professions

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