University of Oklahoma – Tulsa Research Forum 2021

Book of Abstracts

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Dear colleagues,

I would like to extend a warm welcome to all of you who are joining us for the first time as well as to those who have been long-time supporters of Research Forum. It is my pleasure to share with you the abstract book for OU-Tulsa's 2021 Research Forum. The OU-Tulsa Research Forum is an annual event to showcase student, staff, and resident research.

Research Forum will be hosted virtually this year due to current public health best practices. This year, the trainees have a new opportunity to provide a brief narrative describing their posters. We hope this will enhance what people can learn about each research project. Awards will be given for the strongest posters in each submission category.

In accordance with OU-Tulsa's commitment to inclusivity, we have added a new Diversity, Equity, and Inclusion poster award this year. This award will recognize a poster that centers on social justice research and also describes that research using inclusive language. In addition, a new Convergence Research award has been added this year, speaking to OU-Tulsa's encouragement of cross-disciplinary, collaborative work. Trainees have indicated if their work should be considered for one or both of these awards.

We hope members of the research community and the greater Tulsa community enjoy learning about the array of research projects presented this year. This book contains the abstracts of accepted posters of the OU-Tulsa 2021 Research Forum.

I would like to acknowledge the School of Community Medicine's Office for Research Development and Scholarly Activity and the OU-Tulsa Schusterman Library for their dedicated commitment in planning and organizing the OU-Tulsa 2021 Research Forum.

On behalf of the OU-Tulsa 2021 Research Forum Program Committee, we look forward to learning about the innovative research projects across our campus. Thank you in advance for your support of research in the Tulsa community.

Sincerely,

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*Please note that the abstracts in this book are from the authors' original submissions. Any revisions an author has made to an abstract upon acceptance are available to read when opening their poster on the Open Science Framework.

Biomedical

ABSTRACT #6: VENOUS THROMBOEMBOLISM: A FIRST SIGN OF MALIGNANCY

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Dr. Zamak Khorgami - The University of Oklahoma, School of Community Medicine
Dr. Hyein Kim - The University of Oklahoma, School of Community Medicine
Dr. William Jennings - The University of Oklahoma, School of Community Medicine
Dr. Steven Vang - The University of Oklahoma, School of Community Medicine
Dr. Kimberly Zamor - The University of Oklahoma, School of Community Medicine
Dr. Peter Nelson - The University of Oklahoma, School of Community Medicine
Kelsey Babb - The University of Oklahoma, School of Community Medicine

Introduction: Venous thromboembolism (VTE) is commonly known to be associated with malignancy; however, there is limited analysis of a VTE as a first presenting indicator. The aim of our study is to evaluate the incidence and predictors of unrecognized malignancy in patients presenting with VTE.

Methods: We performed a retrospective analysis of the Nationwide Readmission Database including patients age≥18y presenting with a primary diagnosis of deep vein thrombosis (DVT) or a pulmonary embolism (PE).
Patients known to have malignant diseases were excluded. Outcomes include the rate of newly diagnosed malignancy within 6 months and predictors for diagnosis of malignancy. Regression analysis was performed.

Results: A total of 116,048 patients with VTE (49.8% DVT, 41.7% PE, 8.6% DVT and PE) were identified of which; 16% (n=18,294) had been previously diagnosed with malignancy were excluded. Of the remaining 97,754 patients, 31% were readmitted within 6 months. The incidence of newly diagnosed malignancy within 6 months was 3% (n=909). The most common malignancies were gastrointestinal malignancies (29.2%). **Table 1** demonstrates predictors for diagnosing a new onset malignancy within 6 months upon readmission. On ROC analysis a cut-off score of 3 (sensitivity: 86%, specificity: 89%) was found to be predictive of an increased risk of new onset malignancy within 6 months.

Discussion: Venous thromboembolism is a significant risk indicator of underlying malignancy. Validation of a patient risk stratification score using multiple predictors on index admission may offer an opportunity for early diagnosis

Table 1: Multivariable Regression: Predictors of New Onset Malignancy Following VTE

Variable	OR	95% CI	P-Value
Age>65	1.16	1.04 – 1.58	0.01
Female	1.08	1.02 – 1.93	<0.01
IVC Thrombosis	2.80	1.51 – 3.67	<0.01
Upper Extremity Thrombosis	1.45	1.1 – 1.94	<0.01
Charlson Comorbidity Index	1.34	1.15 – 1.74	<0.01

ABSTRACT #7: IMPACT OF PHENOTYPE AND GENOTYPE ON RESPONSE TO TRIPLE COMBINATION CFTR MODULATORS

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Elise Knowlton - The University of Oklahoma, School of Community Medicine
Dr. Michelle Condren - The University of Oklahoma, School of Community Medicine

Introduction: Triple combination CFTR modulator therapy (elexacaftor, tezacaftor, and ivacaftor) was recently approved for use in the U.S.A. and the extent of the medication's impact on those with cystic fibrosis (CF) is still being explored. Patients with FEV1 > 90% and < 40% predicted were excluded from clinical trials. Additionally, patients heterozygous for F508del with a second mutation responsive to tezacaftor/ivacaftor were not studied. To assess the utility of triple combination therapy, this project was conducted to examine differences in lung function improvement based on previous modulator use, mutation type, and baseline lung function.

Methods: A CF center serving adult and pediatric patients began utilizing triple combination therapy in November 2019. De-identified lung function, weight, mutation type, and previous modulator therapy were obtained from the CF Patient Registry and analyzed. For all patients, the highest of two pre-treatment FEV1 readings was compared to post-treatment FEV1. All patients' pre- and post-treatment body weights also were evaluated.

Results: Across 35 patients, average time between therapy start and first post-FEV1 measurement was 41.7 $\pm$ 25.7 days. Overall, post-treatment FEV1 percent predicted (85 $\pm$ 27%) was significantly higher than pre-treatment (74 $\pm$ 26%), $p<0.001$. Similarly, post-treatment body weight (56.3 $\pm$ 12.3 kg) was greater than pre-treatment (55.1 $\pm$ 12.9 kg), $p=0.003$. Percent and absolute changes in FEV1 were further assessed by baseline lung function, mutation category, and previous modulator use (Table 1). Average percent FEV1 change was greatest for patients with the lowest baseline lung function relative to patients with intermediate and the highest baseline lung function. The heterozygous mutation category had greater average increase in FEV1 percent predicted and percent FEV1 change relative to individuals homozygous for F508del. Lastly, patients previously not on a modulator had higher average change in FEV1 percent predicted and percent FEV1 change compared to patients on a modulator previously.

Discussion: These findings support previous findings that triple combination therapy improves lung function and offers other health benefits such as increased body weight for CF patients. Furthermore, this analysis demonstrates that those excluded from clinical trials can expect to see similar improvements. This study represents a small number of patients and deserves further investigation; however, these findings should inform patient education and reasonable expectations upon beginning this novel CF therapy in understudied populations.

ABSTRACT #20: ANTIVENOM USE OR OBSERVATION FOR PATIENTS WITH COPPERHEAD SNAKE ENVENOMATION?

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Dr. Fatima Ramirez-Cueva – Augusta University, Pediatrics Emergency Medicine
Dr. Adam Larsen – The University of Oklahoma—Tulsa, Pediatrics
Dr. Michelle Condren – The University of Oklahoma—Tulsa, Pediatrics
Dr. Megan Woslager – The University of Oklahoma—Tulsa, Pediatrics
Elise Knowlton – The University of Oklahoma—Tulsa, Pediatrics
Robin Rainey – The University of Oklahoma, School of Community Medicine
Amy Hendrix – The University of Oklahoma—Tulsa, Pediatrics

Introduction: Crotaline snake envenomation is a potentially serious medical condition affecting thousands of Americans each year. Snakes in the subfamily Crotalinae include, but are not limited to, copperheads, rattlesnakes, and cottonmouths. Variation in treating crotaline snakebites exists among physicians in the United States. In particular, managing copperhead envenomation is hypothesized to require minimal intervention, rarely requiring antivenom use and, even rarer, surgical intervention. This study assessed FabAV antivenom use and treatment outcomes for copperhead-envenomated patients in northeastern Oklahoma.

Methods: A retrospective cross-sectional review examined electronic medical records (EMR) of patients with crotaline snakebites from July 1, 2014 to August 31, 2019 at St. Francis Hospital in Tulsa, Oklahoma. Patient demographics, snake species, clinical presentation, comorbidities (psychiatric, cardiovascular, pulmonary and hematologic/oncologic), lab results, and treatment types (FabAV or observation) were collected. Associations between patient variables and treatment were evaluated using the $\chi 2$, Median tests, and binary logistic regression.

Results: Of 256 patients meeting inclusion criteria, 139 were envenomated by a copperhead. Compared to patients under observation (no antivenom, n=42), those treated with antivenom (n=97) were more likely to have ICU stays ($\chi 2(1)=29.5$, $p<0.001$). Few patients under observation experienced complications requiring intervention (n=3, 7%) or ICU stays (n=2, 5%). For FabAV-treated patients, 17% experienced complications (n=16) and the majority had an ICU stay (n=54, 56%). Comparing the antivenom administered vs. observation cohorts, there were no statistically significant differences in the proportion of patients who were hemotoxic ($\chi 2(1)=0.91$, $p=0.34$), or in the number of systemic symptoms ($\chi 2(1)=0.78$, $p=0.38$). Progression of venom effects across major joints ($p=0.001$) and number of patient comorbidities ($p<0.05$) were significantly associated with FabAV treatment in a binary logistic regression model.

Discussion: For those patients with a copperhead envenomation, treatment by observation had favorable patient outcomes, including reduced chance of an ICU stay and reduced overall length of hospital stay. Hospital policy of administering antivenom in the ICU for adult patients may contribute to the association between ICU stay and antivenom treatment.

Abstract #22: FATTY INFILTRATION IN CERVICAL FLEXORS AND EXTENSORS IN DEGENERATIVE CERVICAL MYELOPATHY

Dr. Monica Paliwal – The University of Oklahoma, Gallogly College of Engineering
Dr. Zachary Smith – The University of Oklahoma Health Science Center, College of Medicine
Dr. Kenneth Weber – Stanford University
Dr. Andrew Smith – Regis University, Rueckert-Hartman College for Health Professions
Dr. James Elliott – University of Sydney, School of Health Sciences
Dr. Fauziyya Muhammad – The University of Oklahoma Health Sciences Center, College of Medicine
Dr. Jerzy Bodurka – The University of Oklahoma, Gallogly College of Engineering

Introduction: Degenerative cervical myelopathy (DCM) leads to spinal cord compression, and symptoms of hyperreflexia, loss of proprioception and strength in the upper extremities, balance and gait abnormalities. However, degree of cord compression only weakly associates with clinical disability. In addition to demyelination of the spinal cord, white matter and gray matter volume loss, changes in cervical muscle composition (increased fatty infiltration) may also contribute to clinical dysfunction. This study aims to examine 1) muscle fat infiltration (MFI) in cervical flexors and extensors, 2) association between MFI and clinical disability.

Methods: Eighteen patients with DCM (8F/10M, age= 59±14 years, BMI=26.0±4.1 kg/m2) and 25 healthy controls (12F/13M, age= 53±12 years, BMI=25.2±3.7 kg/m2) underwent 3D Dixon fat-water MR imaging (Siemens Prisma) of the cervical spine. A dense V-net convolutional neural network (CNN) was used for segmentation of muscles (multifidus and semispinalis cervicis (MFSS), longus colli/capitis (LC), semispinalis capitis (SSCap), splenius capitis (SPCap), levator scapula (LS), sternocleidomastoid (SCM), and trapezius (TR)). Muscle fat infiltration was defined as: MFI = fat signal/(fat signal + water signal) × 100. Clinical scores- modified Japanese Orthopedic Association (mJOA) and Nurick were collected. Mean differences in MFI between patients and controls were assessed (ANCOVA- controlling for age, sex and BMI). We assess association between MFI and clinical disability (Spearman's ρ, $p \leq 0.05$, SPSS).

Results: Patients with DCM had significantly higher MFI in deep cervical flexors (LC: 18.74 ±6.7 vs 13.66 ± 4.91, p= 0.021) and extensors (MFSS: 20.63 ±5.43 vs 17.04 ± 5.24, p= 0.043) than controls but not in superficial muscles (SSCap, SPCap, LS, SCM, TR). Increased clinical disability was associated with increased MFI in LC (mJOA: ρ = -0.399, p=0.008 and Nurick: ρ = 0.436, p=0.003) and MFSS (mJOA: ρ = -0.332, p=0.036 and Nurick: ρ = 0.341, p=0.031).

Discussion: We found increased fatty infiltration in deep cervical flexors and extensors associate with sensorimotor deficits and clinical disability. Muscle denervation due to spinal cord compression may lead to increased MFI and degeneration. Higher MFI may diminish muscle contractibility and affect postural biomechanics, proprioception and fine motor control. These findings validate fatty infiltration in deep cervical muscles as a component of DCM's pathophysiology. MFI assessments may inform management, interventions and clinical care in patients with DCM.

ABSTRACT #24: AUTOGENOUS VASCULAR ACCESS IN AMERICAN INDIANS

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Dr. Kelly Kempe – OU-TU School of Community Medicine
Dr. Viraj Pandit – OU-TU School of Community Medicine
Dr. Peter Nelson – OU-TU School of Community Medicine
Dr. William Jennings – OU-TU School of Community Medicine

Introduction: American Indians (AI) have the highest prevalence of diagnosed diabetes which continues to be the leading primary cause of end stage renal disease (ESRD). As a consequence, ESRD in AI is 1.5 times greater than White Americans, but there are limited studies in this population regarding hemodialysis outcomes. We review our experience creating autogenous vascular access for AI patients.

Methods: Consecutive new referrals who self-identified as AI and underwent creation of a vascular access for hemodialysis during a ten-year period were reviewed retrospectively. Patient demographic data, access outcomes, operative procedures and complications were analyzed. Vascular mapping was performed by the operating surgeon to create the operative plan.

Results: All patients had an autogenous access constructed. 235 AI were treated during the study period and all were included in the analysis. 196 (83%) of the patients were diabetic, 99 (42%) were men, and 64 (27%) obese. Mean age was 57 years (15-89 years). 86 (37%) had a previous failed access operation. The procedures included 158 (67%) direct AVFs and 77 (33%) transpositions or translocation procedures. Mean follow-up was 22 months (1-110 months). 173 (74%) of the access operations used the radial or ulnar artery for AVF inflow. Three patients developed steal syndrome, all treated successfully with access preservation. Six patients had ipsilateral AVFs created after a failed graft placed elsewhere. Primary and cumulative patency rates were 59.6% and 93.4% at 12 months and 59.4% and 92.4% at 24 months, respectively.

Discussion: Despite higher rates of obesity, diabetes, and previous failed access attempts, a safe and functional autogenous vascular access was created in 235 American Indian patients with cumulative patency of 92.4% at 24 months. Because AI have such a high rate of ESRD and there are very few studies in this patient population, we urge continued reporting.

ABSTRACT #26: FACTORS THAT PREDICT PEDIATRIC MEDICATION RECONCILIATION ERRORS ON ADMISSION

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Dr. Jennifer Le – The Children's Hospital at St. Francis
Dr. Michelle Condren – The University of Oklahoma, School of Community Medicine

Introduction: Pediatric patients with chronic medical conditions may experience harm from incorrect medication reconciliation upon admission to the hospital. Literature suggests there are certain predisposing pediatric factors for reconciliation errors such as neurological disease (especially seizure disorder), cystic fibrosis (CF), congenital heart disease (CHD), psychiatric admission, and five or greater medications. Our objective was to discern factors associated with increased medication reconciliation error upon admission to a general pediatric hospital service. Factors studied include: pediatric-specific risk factors (neurological disease, seizure disorder, CF, CHD, five or greater medications, psychiatric admission); demographic factors (age, gender); and health-system specific factors (type of medication review, EPIC medication reconciliation score).

Methods: This study was conducted for admissions occurring from February to November 2020 at St. Francis Children's Hospital in Tulsa, OK. We collected de-identified data on pediatric patients with at least one of the six outlined pediatric risk factors. Other data collected included demographics, medical conditions, medication class, errors, and type of medication reconciliation review (nurse, physician, both, or none). Descriptive and inferential statistics were completed using SPSS. Total unique medication errors were regressed on patient age, gender, EPIC medication reconciliation score, total medications, risk factors, and type of review.

Results: Pediatric patients (n=132) had an average age of 11 ± 5.9 years and were 52% female. The average number of patient medications prior to admission was 5.8 ± 4.1. The majority of patients (n=82, 62%) had a medication error when comparing the home medication list to hospital medication list. The most common medication error was incomplete information (n=46 patients, 35%), with 90 total medications affected by this error. The second-most common error was medication(s) listed that the patient was no longer taking (n=29 patients, 22%), with 59 inactive medications listed. Of the pediatric risk factors explored, the only variable predicting reconciliation errors was the total number of medications prior to admission (p=0.023). Age, gender, EPIC medication reconciliation score, type of medication reconciliation review, and number of underlying conditions did not predict likelihood of medication errors.

Discussion: The majority of patients had a medication reconciliation error. The number of unique errors experienced by a patient seemed discernible by total number of medications, not specific medical conditions. Health systems may need to adjust workflow to prioritize ensuring accurate medication reconciliation for these high-risk patients.

ABSTRACT #32: PREDICTING SEX FROM rsfMRI BASED ON FUNCTIONAL CONNECTIVITY AMONG PARCELLATED BRAIN REGIONS

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Runfeng Tian – The University of Oklahoma, Gallogly College of Engineering
Dr. Jerzy Bodurka – Laureate Institute for Brain Research
Dr. Yuan Yang – The University of Oklahoma, Gallogly College of Engineering

Introduction: Recent studies indicate that participant's gender may have a substantial influence on cognitive functions and pathophysiology. Women are reported to be more than 2 times likely to suffer from mood and anxiety disorders and Alzheimer disease than men. MRI technologies are widely used to investigate the human brain structure and functions, including recent studies focusing on sex differences. A recent study has suggested that sex-related brain structural differences likely exist, with morphological differences at many cortical and subcortical regions, even in the healthy human brain (Yang et al, 2019). We hypothesize that i) such brain structural differences likely exist in brain resting-state fMRI (rsfMRI) functional connectivity (rsfMRI-fc) ; ii) such sex effects could be utilized to distinguish or predict women vs men gender from the rsfMRI-fc data with machine learning (ML) approaches.

Methods: We used open-access Human Connectome Project S1200 Data Release (Van Essen et al., 2013), which includes rsfMRI scans totaling one hour each for 812 subjects: 410 female, 402 male, and 0 of other gender identities. The data was preprocessed using the standard pipeline from Human Connectome Project (Smith, 2013). This was followed by spatial parcellation (FSL's MELODIC) and rsfMRI-fc calculation between each parcel (FSLNets) (Jenkinson et al., 2012). The functional connectivity measurements were fed into two ML algorithms: support vector machine (SVM) and artificial neural networks (ANN).

Results: The ANN ML approach yielded 98% classification accuracy distinguishing females, males, and those of other genders, producing receiver operating characteristic (ROC) curves with areas under the curve above 0.95. Furthermore, we found that filtering out functional connectivity measurements utilizing low conditional entropy requirements (~ 95% of the data) actually improve the classification performance in high complexity parcellations from 98% to 99% accuracy. The functional network in the occipital and parietal lobes tend to be the most prominent to distinguish functional connectivity differences among females and males, with most of the relevant brain regions (parcels) located in the brain's inferior areas.

Discussion: Our results indicated that parcellated brain regions in close proximity and without overlapping were the largest contributors for correct sex classification. This finding is consistent with previous reports on the sex-difference highlighting role of local brain fiber structure (Yang et al., 2019). Sex-difference in rsfMRI-fc in the occipital and parietal lobes is likely related to sex-specific visual information processing at the dorsal stream and may be related to own-gender bias in face recognition (Herlitz & Loven, 2013).

Education

ABSTRACT # 3: FORMATIVE ASSESSMENT IN ONLINE NURSING EDUCATION

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Dr. Helen Farrar – The University of Oklahoma, Fran and Earl Ziegler College of Nursing

Introduction: COVID-19 has caused a dramatic shift in many nursing schools to shift from traditional pedagogy to online pedagogy without allowing for appropriate review of evidence based literature on online education practices. In order to provide evidence based curriculum, nurse educators are responsible to be proficient in applying research based information to their instructional methods. In the case of formative assessment, the traditional classroom allowed for in-person formative assessment, particularly when assessing competency in nursing skill development. As the pandemic continues, nursing programs are increasingly transitioning to online education, therefore there is a need to explore available research on formative assessment in the virtual classroom.

Methods: A review of the literature was performed to assess the state of knowledge regarding formative assessment in online higher education using the following search engines: CINAHL, EBSCO, and Google Scholar. Terms used for the literature search were online learning, faculty, formative assessment, evaluation, peer assessment, engagement, and assessment. Inclusion criteria included formative assessment strategies used within an online environment such as engagement, feedback, and peer assessment. The search returned 88 articles and 26 met inclusion criteria.

Results: Of the 26 articles, there was a variety of formative assessment and feedback strategies discussed, each with their own methods, and analysis of effectiveness. Technology, information support, faculty knowledge and training were identified as barriers to formative assessment in the online environment. There was a lack of description on how to overcome these barriers in the online environment. Varied strategies and a lack of research on overcoming barriers to formative assessment in an online environment makes it difficult for educators to determine best practices when transitioning to the online classroom.

Discussion: There is a lack of research based literature on implementation of formative assessment in the online environment. Institutions of higher education with nursing programs must recognize that faculty are unprepared and need education, time to dedicate to formative assessment technique development and continuous information technology support. The literature supports that implementing these strategies will allow nursing faculty to utilize formative assessment and ensure knowledge transfer is adequate for future nurses to practice safely.

ABSTRACT #4: VIRTUAL EDUCATION IN THE EARLY CHILDHOOD WORLD

Brandy McCombs – The University of Oklahoma, Jeannine Rainbolt College of Education

Introduction: Covid-19 forced educators to abandon traditional brick and mortar platforms and experience the growing trend of virtual education (United Nations, 2020). Virtual education began in higher education, influenced secondary education, and now is present in elementary and early childhood education (ECE) (Kennedy & Archambault, 2012). Through this growth, constructivist educators who are within the ECE field are left with the challenge of teaching through a screen instead of the traditional way: in person. ECE educators who believe in the constructivist approach typically place their students in an authentic learning culture while using many techniques such as scaffolding and supportive guidance (Mills, 2007). Utilizing the sociocultural approach, this phenomenological qualitative study expands the current ECE research highlighting virtual education.

Methods: Three research questions guided this expansion. What strategies do early childhood teachers use to ensure virtual education is significant and successful for their students? By using qualitative interviews, 10 virtual ECE educators across Oklahoma share how they teach with a constructivist approach virtually and their perceived effects of instruction. Secondly, What professional development opportunities are school administrators offering to support virtual teachers? To gain the administrative perspective, 10 Oklahoma administrators voice their perception of virtual education within the ECE grade levels. Finally, What preparation methods are higher education organizations changing to reflect the growth of virtual learning in early childhood? To expand the insight in pre-service education, 10 higher education professors explain the steps their organizations are taking to prepare pre-service ECE teachers for this large onset of technology. Cycle one coding through the narrative paradigm (Bazeley, 2013) was used to categorize and associate the educators' responses and connections were drawn. Common themes within each participant sub-group became prevalent and note-worthy.

Results: ECE classroom teachers interviewed expressed great frustration in attempting to apply the same lesson execution methods which deemed successful for years within the brick and mortar setting yet came up flat through a computer screen by virtual learning. ECE administrators expressed concern at the lack of professional developmental support offered at such a pivotal point within the field. Finally, ECE professors collectively agreed due to the great influx of technology use within ECE classrooms, re-evaluation of technology preparation and effective teaching methods for pre-service teachers are in dire need.

Discussion: Through the explosion of technology within ECE, this study provides further implications for deeper support for pre-service teachers, wider technology and application support for current ECE teachers.

ABSTRACT #5: USE OF METAPHORS AS AN EXPLANATION TOOL IN ACES SIMULATION TRAINING

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Khup Mang – Rogers State University, College of Arts and Sciences
Dr. Frances Wen – The University of Oklahoma, School of Community Medicine
Dr. Kim Coon – The University of Oklahoma, School of Community Medicine
Dr. Julie Miller-Cribbs – The University of Oklahoma, College of Arts and Science
Dr. Martina Jelley – The University of Oklahoma, School of Community Medicine

Introduction: Adverse childhood experiences (ACEs) have profound long-term effects on chronic disease and adult health risk behavior. Discussion of ACEs and health can be challenging in a medical encounter for both clinicians and patients, and tools to improve understanding may be helpful. The ACEs/Trauma Informed Care (TIC) team at OU Tulsa has been training health professionals about ACEs and communication skills since 2015. One component of the teaching involves "Explanation of ACEs", in which common literary devices such as metaphors can help explain complex concepts. The purpose of this analysis is to explore the characteristics of effective metaphors in communication of the connection between ACEs and adult health.

Methods: The comprehensive ACEs skills training consisted of didactic sessions, training simulations with standardized patients, and a faculty-led debrief. Discussion and examples of explanatory metaphors occurred in the didactic session. The healthcare trainees included medical residents and students of various disciplines, including medicine, physician assistant, nursing, MSW, physical therapy, and occupational therapy. A total of 434 simulation training videos were collected. The videos were coded and a sample (n=29) of these videos were extracted for analysis. A standardized entry form was created to document metaphor use in each video, including the type of metaphor, length of discussion, and effectiveness of ACEs discussion. To assess the effectiveness of each metaphor use, a rubric was designed based on the trainee's ability to transition into the metaphor, explain the metaphor, and receive positive patient feedback. Basic statistical analysis was then conducted on the rubric data. The team was most interested in determining if a certain metaphor performed better than others and sought to discover underlying factors that impact effectiveness.

Results: Of the 29 simulations viewed, 16 unique metaphors were used. The most common was the volume dial (n=8) to explain enhanced symptoms related to toxic stress, followed by the overloaded backpack (n=5), which scored higher in effectiveness. Time spent in metaphor discussion ranged from 17 to over 120 seconds. Preliminary data suggests that discussions lasting about 45 seconds were optimal in achieving the greatest degree of effectiveness.

Discussion: As medical knowledge of trauma-informed care continues to grow, evidence-based methods for teaching ACEs are an area of increasing importance. Our preliminary research suggests literary devices such as metaphors may be effective explanation tools for clinicians discussing difficult topics with their patients. Understanding how metaphors can best be used will likely improve skills-based education and patient care.

ABSTRACT #8: SURGERY TRAINING IN OPEN AORTIC CASES IN POST ENDOVASCULAR ERA

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Dr. Viraj Pandit – The University of Oklahoma, School of Community Medicine
Dr. Hyein Kim – The University of Oklahoma, School of Community Medicine
Dr. Kimberly Zamor – The University of Oklahoma, School of Community Medicine
Dr. William Jennings – The University of Oklahoma, School of Community Medicine
Dr. Kelly Kempe – The University of Oklahoma, School of Community Medicine
Dr. Todd Hasenstein – The University of Oklahoma, School of Community Medicine
Dr. Peter Nelson – The University of Oklahoma, School of Community Medicine

Introduction: Increasing concern exists regarding declining trainee exposure to open abdominal aortic procedures. The time period of 2005-2010 encompassed an evolution of endovascular surgery and is commonly known as the "Endo Era," when endovascular aortic repair (EVAR) became prevalent and open cases decreased dramatically. The aim of this study was to assess contemporary surgery trainee (resident/fellow) involvement in open abdominal aortic cases and any impact on patient outcomes since the Endo-Era.

Methods: We performed a 5-year (2011-2015) retrospective analysis of the National Surgical Quality Improvement Program (NSQIP) database including all patients with open abdominal aortic procedure. Patients were stratified based on year and trainee involvement in the procedure. The primary outcomes were open surgical exposure of various trainees and 30-day patient outcomes. Trend analysis was performed to assess outcomes measures.

Results: A total of 12,420 patients underwent open abdomen aortic procedures of which 59.2% procedures involved trainee. Over the study period trainee involvement in the procedures decreased significantly from 66.8% in 2011 to 52.1% to 2015 (p=0.01) while attending only procedures increased. (Figure 1). Involvement of trainee was not associated with development of complications (p=0.25) and mortality (p=0.59). There was a trend towards lower complications in both trainee and attending only group over the study period (p=0.08). Mortality rate remained unchanged (p=0.41)

Discussion: There has been a significant decrease in trainee involvement in open aortic procedures without influencing patient outcomes. The causes for increase in attending only open aortic procedure is unclear. Further guidelines need to be established to provide adequate exposure and training among vascular trainee.

ABSTRACT #18: "DO I HAVE TO REPAY THOSE?" FINANCIAL LITERACY AND READINESS OF THE INTERNAL MEDICINE RESIDENTS AND MEDICAL STUDENTS

Dr. Dru Albin – The University of Oklahoma, Internal Medicine
Dr. Jesse Richards – OU Health, Assistant Professor of Medicine

Introduction: Many start medical school with the understanding that a medical degree is expensive but have little idea on how they plan to pay for it. There are few, if any, lectures for medical students and residents on basic finance and loan repayment strategies. Financial stress is just another burden that residents face in training and it can lead to resident burnout. Adjusted for inflation, the cost of medical school has increased by 94% since 1978. The average total student debt among medical school graduates is $241,600. Our goal is to empower residents and students to engage in self-directed learning and begin managing money better.

Methods: Demographic information, debt, assets, and baseline financial readiness were assessed with a pre- lecture survey. Participants included internal medicine residents and medical students on IM clerkship and had a one-hour lecture on pertinent financial topics ranging from student loan pay-back strategies to beginning initial investments. Post-lecture, we held breakout sessions based on class year and moderated by faculty.
After one week, a similar post-lecture survey was sent out to gauge level of understanding and measure any improvements.

Results: Twenty-five participants completed the pre-lecture survey. The average student loan debt was $5,240 for undergraduate and $162,240 for graduate school. Average total household debt amounted to $263,240. Average household income was $88,000. The average assets amounted to $54,640. Total female debt of $227,500, household income of $82,000, and assets at $40,268. Total male debt of $307,727, household income of $96,636, and assets of $72,931. Eleven people participated in the post-lecture survey. Participants in the pre-lecture assessment scored 58% correct. Participants in the post-lecture assessment scored 64% correct. Level of confidence in financial plan was 3.4 out of 5 before lecture, and 3.6 after lecture. Using Modified Likert Scale from 0-5 for level of agreement, the statement "Financial stress contributes to resident burnout" received a score of 4.17 and the statement "I would recommend this lecture format and Q&A session in the future" received a score of 4.5.

Discussion: Our program is below the national average debt. Our females may take on less debt but have less income and assets, possibly signifying a debt adverse financial strategy. This lecture format and Q&A session was well received and resulted in slight improvement in financial knowledge. Although limited by sample size, our survey showed the serious financial burden residents and medical students endure to pursue a career in medicine.

ABSTRACT #27: VARIATIONS OF RACE AND GENDER EFFECTS IN PRESCHOOL SOCIAL-EMOTIONAL MEASURES

Denise Vega Ruvalcaba – The University of Oklahoma, Jeannine Rainbolt College of Education
Dr. Shinyoung Jeon –The University of Oklahoma, Senior Research and Policy Associate
Lisa Eshenour – The University of Oklahoma, Project Director
Dr. Sherri Castle – The University of Oklahoma, Assistant Director for Research

Introduction: Young children rapidly develop social-emotional skills that are necessary to interact with teachers and friends, accomplish goals, and regulate their emotions. In addition, social-emotional competence has been linked to higher academic achievement as well as positive adult outcomes later in life. Even though much research has documented the importance of young children's social-emotional skills for their short- and long- term outcomes, social-emotional skills have been defined in several ways, and measures assessing social- emotional skills vary. Thus, this study examined how social-emotional skills were captured consistently or differently by measures, especially informants, and how these differences are associated with children's gender and race/ethnicity.

Methods: This study used a dataset of children (n = 764; 409 boys; Black /African American =236, Hispanic/Latino=319, Other races=127, White=82) from a local Early Head Start (EHS)/Head Start (HS) program. Four approaches to measuring children's social-emotional development were used: 1) a direct, task-based assessment of executive function (Minnesota Executive Function Scale; MEFS), 2) an examiner rating scale of children's behavior (Leiter-3), 3) a teacher rating scale of children's behavior (Devereux Early Childhood Assessment for Preschoolers/Toddlers (DECA-P2, DECA-T) and 4) a direct observation of children's individual behaviors (Child Observation in Preschool(COP).

Results: Results showed consistent patterns across measures that boys had lower social-emotional competence compared to girls. Boys had lower executive function (M= 93.73, SD = 10.66, girls M= 95.91, SD=8.26), $t(723) = 3.12$, $p < .01$. Teachers reported boys having more behavioral concerns (M=52.9, SD =10.07, girls M=47.56, SD=8.56), $t(638) = -7.31$, $p < .001$ and these ratings were consistent with assessor ratings. Observed behaviors showed boys being more disruptive (M=.02, SD =.05, girls M=.01, SD =.03), $t(563) = -3.74$, $p< .001$. Additionally, Black /African American children had lower social-emotional competence compared to children of other races based on assessors' and teachers' reports. However, this racial difference was not apparent in direct observation of children's individual behaviors or the direct assessment of executive function.

Discussion: Gender differences are evident in young children's social-emotional development. Boys might require additional support in the EHS/HS program to help them acquire the social-emotional skills they need to have better academic and social outcomes in the future. However, measures and informants are associated with how children were rated based on their race/ethnicity. These results suggest that further research is needed to examine measurement invariance tests for social-emotional skills across race/ethnicity.

ABSTRACT #34: THE ASSOCIATION OF INDIVIDUAL CHARACTERISTICS, CLASSROOM QUALITY, AND APPROACHES TO LEARNING

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Introduction: Early childhood is a critical period for children to develop Approaches to learning (ATL). ATL is malleable in early childhood and amenable to interventions. ATL reflects the ability to manage emotions, behaviors, and attention to actively engage in learning, which has been found to be particularly crucial for children at risk. Despite the importance, few studies focused on the development of ATL in early childhood and examined individual and classroom factors for ATL of children from low-income families in tandem. Thus, the current study examined how individual child characteristics and the classroom quality are associated with their development of ATL in Head Start programs.

Methods: The study used the 3-year-old cohort (n=1,954) from Head Start Family and Child Experiences Survey 2009 Cohort dataset (FACES 2009; Administration for Children and Families, 2013). For this study, multilevel growth curve modeling was implemented. To examine the development of ATL, we created the time variable and coded -3 for Fall 2009 (HS entry), -2 for spring 2010 (first year in HS), and 0 for spring 2011(second year in HS). This study used two sets of predictors: 1) children's social skills, behavior problems, inhibitory control and children's ATL which are teacher-reported. 2) The mean scores of classroom quality (emotional support, classroom organization, instructional support) measured using the Classroom Assessment Scoring System (CLASS; Pianta et al., 2008) at the first and second years.

Results: Results showed that girls (b=-0.08, p=0.01), Hispanic (b=0.13, p=0.00) and children with higher inhibitory control (b=0.01, p=0.00), social skills (b=0.05, p=0.00), and lower problem behavior scores (b=-0.03, p=0.00), at the HS entry have higher ATL scores than their counterparts at the HS final point. Also, children from the classroom with higher levels of emotional support (b =0.17, p=0.00) demonstrated higher ATL than who experience lower levels of emotional support. In addition, girls over boys, Hispanic (b=0.13, p=0.00) over other groups, and children with lower social skills in the HS entry showed faster development of ATL. Different from our expectation, children from the classroom with a higher classroom organization score (b=-0.05, p=0.05) showed slower development in ATL.

Discussion: Overall, these findings provided evidence showing the rapid development in ATL in early childhood and underscore the benefit of having higher levels of social-emotional and social-cognitive skills and emotional support. Meanwhile, when the classroom is structured and restricted, children could be less desirable to explore and less intrinsically motivated to learn, resulting in lower ATL.

ABSTRACT #123: CORONAVIRUS DISEASE 2019 AND TRANSFORMATION OF EDUCATION WITH TECHNOLOGY: INVESTIGATING PRESERVICE TEACHERS' VIEWS AND PRACTIVE OF TECHNOLOGY

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Introduction: The purpose of this study was to examine early childhood education preservice teachers' (PST) views and practice of technology to understand how Coronavirus Disease 2019 pandemic transformed early childhood education. This pandemic required considerable adjustment for using technology in early childhood institutions and teacher education. Additionally, this study examined the virtual lessons that PSTs made and uploaded to the OU-Tulsa Early Childhood Education YouTube channel to apply the technology for their practicum.

Methods: The research designed to examine PST's views and practice of technology as a qualitative case study during fall 2020; participates included ten students enrolled in three early childhood classes: teaching and learning in ECE, field placement, and learning with educational technologies. Since ten students entered the program as a cohort, these are the same students for all classes; data sources were four photo essays, ten virtual lessons, PSTs' reflections, in-class practice and discussions, and teacher educators' anecdotal notes.
Three-level qualitative analysis was conducted using Dedoose (www.dedoose.com), a cross-platform app for analyzing mixed-methods research.

Results: Overall, PSTs' views indicated rapid changes and challenges in ECE about technology as a new normal. The adjusted practicum from in-person placements to virtual placements challenged the PSTs because they had to create appropriate virtual lessons using technology; as the semester progressed, their lesson objectives became more diverse, focusing more on the children's needs and involving caregivers/teachers. More specifically, these changes and challenges centered around three themes, 1) PSTs viewed the current status of education as in crisis but understood that learning could continue by using technology to support young children's education 2) PSTs were concerned about children's social-emotional challenges and looked for ways to support their social-emotional needs using technology; 3) PSTs used many strategies to demonstrate care for their young children's basic needs and ensured family involvement/engagement through technology.

Discussion: Coronavirus Disease 2019 transformed ECE and teacher education regarding technology in more effective ways to promote young children's education, social-emotional support, and care. The role of technology in early childhood education is inevitable in the current and post COVID-19 worlds. This study suggests transformations and adaptations in preservice teacher education, including innovative ways of student-teacher placements—implications for in-service professional development opportunities are needed to ensure that teachers are better prepared to use technology for teaching and learning.

ABSTRACT #124 EVALUATION OF TEACHER PRACTICES DURING THE EARLY CHILDHOOD CLASSROOM MEALTIME

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Introduction: Many children eat approximately half of their meals in early care and education (ECE) settings. ECE mealtimes offer learning opportunities for children to practice developmental skills while developing healthy eating behaviors. Child obesity researchers also recognize the highly influential nature of the ECE mealtime and teacher practices to young children's health and endorse responsive feeding practices in the ECE classroom. However, many teachers do not implement these practices. The promotion of responsive feeding practices as important teaching practices within ECE is limited, indicating a better alignment of teaching and feeding practices is needed. Additionally, research examining children's response to feeding practices in the classroom is limited. Therefore, this study evaluates the relationship between teaching and feeding practices during mealtime, and associations between teacher practices and children's behavior during mealtime.

Methods: Fifty teachers in ECE programs and 150 children (2-5 years old) in their corresponding classrooms who agreed to participate were video recorded during a classroom lunchtime. Trained observers scored videos using a) the Mealtime Observation in Childcare Checklist (MOCC), for teacher feeding practices, b) the Classroom Assessment Scoring System – PreK (CLASS-PreK), for teaching practices and c) a time sampling tool capturing the frequency of teacher mealtime practices and children's behavior at mealtime.COVID-19 pandemic impacts delayed the completion video data collection thus delaying scoring and analysis. All videos are now collected, and most have been scored as described. Scoring and analysis will be completed by the research forum. Correlational analysis will be used with the MOCC and CLASS Pre-K to determine associations between teaching and feeding practices, and with the time sampling scores to determine associations between teacher practices and child behaviors. Associations between individual children's mealtime behavior, classroom level teacher feeding practices, and teaching practices during mealtime will be analyzed through multilevel analysis.

Results: Preliminary analysis shows 77% of teachers sat with children but do not eat (55%) with children. Many (88%) teachers pressured children to eat instead of a responsive and supportive strategy when they refused to try a food. About 26% and 13% of teachers talked to children about hunger and fullness respectively. Peer modeling, role modeling, and self-regulation were significantly associated with and both emotional-behavioral and instructional support.

Discussion: Findings will add to the understanding of how teaching and feeding practices align, aid in improving professional development and interdisciplinary communication efforts for implementing responsive feeding practices and expand quality assessment to extant high-quality care to incorporate classroom routines.

Quality Improvement

ABSTRACT #12: MODIFIED AFITATION SEVERITY SCALE AND TREATMENT ALGORITHM ON AN INPATIENT PSYCHIATRIC UNIT

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Introduction: Agitation is a common problem requiring treatment in acute psychiatric units that can lead to injuries and other poor outcomes. Our pilot study utilized a modified version of the Agitation Severity Scale (MASS) to facilitate earlier identification and treatment of agitation. Although various other scales have been developed for this purpose, we hypothesized that the descriptive nature of the MASS symptom items would provide more utility for treatment planning. We developed a behavioral and medication treatment algorithm paired to scores obtained from MASS nursing assessments. The Clinical Global Impression-Aggression scale (CGI-A) was also added to the order set for comparison.

Methods: The study was performed at a 30 bed acute adult inpatient psychiatric unit. All nursing staff completed a survey to measure their current perceptions of safety and treatment of patient agitation in addition to the Oldenburg Burnout Survey prior to and after the study period. All patients were asked to complete a survey at discharge regarding their perceptions of safety and treatment of agitation. Data was collected for a three month period before and after instituting the protocol. During the three month active intervention stage, all patients were evaluated by nursing staff using the MASS and CGI-A scales at the time of admission and every 8 hours until discharge.

Results: Over twice as many medication doses for agitation were administered during the active study phase ($t(549)=-4.24, p<0.001$). There was a strong and large correlation between MASS scores and the CGI-A scale($r=0.75$, $p<0.001$). Patient safety perception and nurse burnout levels were not significantly different before and after the active study period. Before the active study period, 10% of nurses strongly agreed that a uniform agitation scale would be helpful. However, following the active study period 45% of nurses strongly agreed that a uniform agitation scale was helpful. No significant differences were found in other study measures.

Discussion: Perceptions of safety from patients and nursing staff were not improved or adversely impacted upon MASS protocol implementation. However, the increase in medication doses given provides evidence that the study improved identification of symptoms of agitation and initiation of treatment. Despite an increase in workload for nursing staff upon protocol implementation, burnout rates didn't increase and a majority of nursing staff felt the protocol was helpful. Further research will be needed on larger samples of patients to determine if this protocol will translate to improved outcomes especially in other patient populations.

ABSTRACT #16: PATIENT ATTENDANCE IN THE EARLY LIFESTYLE INTERVENTION CLINIC - A QUALITY IMPROVEMENT PROJECT

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Introduction: In response to the childhood obesity epidemic, the Department of Pediatrics at OU Health-Tulsa created the Early Lifestyle Intervention (ELI) Clinic in 2013. The clinic is a multidisciplinary clinic for weight management. As observed in other pediatric obesity clinics throughout the nation, ELI Clinic has encountered poor patient follow-up. A quality improvement project (QI) was initiated to improve clinic visit attendance.

Methods: For this QI project, a total of three Improvement cycles were completed from 2018 to 2020. The year 2017 was used for baseline comparison. In 2018, ELI Clinic was relocated from Schusterman Center to Tandy YMCA. In 2019, an automated reminder phone call was implemented. Finally, in 2020, a reminder text message was offered to families who opted in. For each year from August to November, the number of scheduled, cancelled, no-show, and completed visits were retrospectively collected from Centricity and Allscripts, recorded in Microsoft Excel, and compared to baseline data from 2017.

Results: In 2017, 69% of scheduled visits were attended by patients (hereafter "completed") relative to all scheduled visits (minus cancellations). In the 2018 cycle, the ELI Clinic location change coincided with an increase in the percent completed visits to 76%. Completed visits rose to 79% in 2019 when automated reminder phone calls were implemented. In 2020, the clinic changed location again due to the COVID-19 pandemic, and initiated reminder texts to families, which coincided with 72% visit completion. While percent of completed visits fluctuated throughout the QI project, this was not statistically significantly associated with baseline or PDSA cycle ($\chi 2=2.27$, $p=0.52$).

Discussion: In August to November of 2018, ELI Clinic location at Tandy YMCA had the highest percent completed visits. However, visit completion was not statistically significant with any of our improvement cycles. The 2020 COVID- 19 pandemic and other unforeseen and unpreventable changes likely affected the QI overall. Reminder phone calls and text messages will continue as we work to identify other barriers preventing appointment attendance that will guide future improvement cycles.

ABSTRACT #19: QUALITY IMPROVEMENT INITIATIVE TO DECREASE MEDICATION RECONCILIATION ERRORS ACROSS PEDIATRIC RESIDENT TEAMS

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Introduction: Pediatric patients with chronic medical conditions are at a high risk of experiencing harm from incorrect medication reconciliation at the time of hospital admission. The objective of this quality improvement initiative was to decrease the frequency of medication reconciliation errors by implementing measures to increase awareness of common types of reconciliation errors and offer education on easy corrective measures.

Methods: This was an interprofessional initiative conducted with the pharmacy department for admissions occurring from February-November 2020 at St. Francis Children's Hospital in Tulsa, OK. Inclusion criteria included pediatric patients (≤18 years) who had at least one of the following pediatric-specific risk factors on admission: seizure disorder, other neurological disease, cystic fibrosis, congenital heart disease, five or more medications, and/or psychiatric admission. Preliminary data was collected (including the patient's EPIC medication reconciliation score) to assess the frequency and types of medication reconciliation errors.
Subsequent interventions were aimed at decreasing the frequency of the common errors by at least 5%. Cycle 1 involved dissemination of a video presentation regarding common reconciliation errors and corrective measures. Cycle 2 involved in-person resident training by an inpatient pharmacist.

Results: A total of 132 patients (52% female) met inclusion criteria for the duration of the QI project, with an average age of 11 ± 5.9 years. The average number of patient medications prior to admission was 5.77 ± 4.14. The majority of patients (n=82, 62%) had a medication error when comparing home and hospital medication lists. The error rate (number of medications affected by an error divided by total number of medications) across PDSA cycles was 39% pre-intervention, and 38% post-intervention. The most common medication error was incomplete information, which affected 16 patients (32%, pre-intervention) and 15 patients (37%) for both post-intervention cycles ($\chi 2(2)=0.29$, $p=0.87$). The only variable predicting reconciliation errors was the total number of medications prior to admission ($p=0.023$).

Discussion: Despite a multi-modal approach to increasing awareness of common medication reconciliation errors, there was no decrease in error frequency seen between pre- and post-interventions. This may be due to several factors including: month-to-month turnover within pediatric resident teams, lower prioritization of medication reconciliation due to urgency of acute patient stabilization, COVID-related limitations to in-person education, and resident burnout. Since the number of prior to admission medications shows predictability for risk of reconciliation errors, this can be used to build an objective EMR score to trigger automatic medication reconciliation by the pharmacy team.

ABSTRACT #23: DISCHARGE DISPOSITION AFTER MAJOR LOWER EXTREMITY AMPUTATION: UNDERSTANDING THE ROLE OF FRAILTY

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Introduction: Lower extremity amputations are expected to double in the next decade as a result of diabetes, hypertension, hyperlipidemia, and an aging population. Frailty syndrome is a product of functional status and overall health. Studies have shown that frailty affects postoperative outcomes and discharge disposition after medical admissions. We aimed to assess frailty and discharge disposition in geriatric patient undergoing major lower limb amputation.

Methods: We conducted a three year analysis retrospective analysis of the NSQIP-database (National Surgical Quality Improvement Program) and included all geriatric (age ≥65) patients who underwent major lower limb amputation (below or above knee). The frailty index was calculated using 15-variables modified frailty index. We defined frail $\geq$ 0.27 and pre-frail as $\geq$ 0.10. Non-home discharge was defined as discharge to skilled nursing facility (SNF) or rehabilitation center. A multivariate regression analysis of age, gender, co-morbidities, procedure type, hospital stay, and complications was completed.

Results: A total of 4,158 geriatric patients underwent surgical amputation of a lower extremity (above knee: 43%; below knee: 57%) Of these patients, 28% were frail and 32% were pre-frail. Mean age was 74 ± 8 years and 64% were male. 31% patients were discharged to a SNF while 36% patients were discharged to a rehabilitation facility. On regression analysis controlling for all contributing factors for discharge disposition, frail (OR [95% CI]: 1.9 [1.1-3.8], p=0.04) and pre-frail (OR [95% CI]: 1.4 [1.2-4.1], p=0.03) patients were more likely to have a non-home discharge. On sub-analysis stratification based on the type of non-home discharge, frail patients (OR [95% CI]: 1.3 [1.1-3.5], p=0.02) were more likely to be discharged to a SNF independent of the type of amputation and insurance status while pre-frail patients (OR [95% CI]: 1.2 [1.05-5.5], p=0.04) were more likely to be discharged to a rehabilitation center.

Discussion: We concluded that frailty syndrome directly impacts discharge disposition for geriatric patients after major lower extremity amputation, regardless of type. Frail patients were significantly more likely to discharge to a SNF while pre-frail patients were likely to discharge to a rehab. Our goal moving forward will be to identify frail patients who will likely necessitate lower leg amputation in the future in an effort to improve their nutritional, functional, and medical status in hopes of improving discharge disposition as the first year after amputation is critical for patient's future mobility status.

ABSTRACT #29: IMPROVING TRANSITIONAL CARE AT OU-TFM

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Introduction: During the two week time period after a hospitalization, patients are particularly vulnerable to clinical deterioration. The reasons for this are numerous but include overall health deterioration including mental and physical health, difficulty with medication regimens, and many others. The COVID-19 pandemic has been challenging but has forced the healthcare industry to implement innovative ideas to deliver healthcare. Likewise, it presented an opportunity for OU-TFM to study how our patients' transition from the hospital and to study our billing of Transitional Care Management (TCM) in the clinic after patients leave the hospital.

Methods: With the help of the medical informatics department, we were able to obtain baseline data from our EMR that showed the number of office visits that were supposed to be billed as TCM and those that were actually billed as TCM. PDSA1: Creating appointments prior to discharge, PDSA2: Having virtual visits with patients after discharge, and PDSA3: Sending EMR flags to care managers to reach out to patients within 72 hours of discharge, with follow-up communication to care managers to make sure that patient has been reached and appointment confirmed. Each cycle lasted two weeks, and the third lasted a month because of the small sample size. The final data was collected and recorded on an excel spreadsheet.

Results: A total of 37 patients met our discharge criteria, to be followed and have data collected, which included being a patient of OU-TFM. Ten patients in the first cycle, 15 in the second cycle, and 12 in the third. The proportion of our TCM qualifying visits increased from 29% at our baseline data to 50%, 27%, and 42% throughout the three PDSA cycles. Our TCM visit billing went from 29% at our baseline data to 29%, 22%, and 0% throughout our three PDSA cycles.

Discussion: Three PDSA cycles were completed to improve the overall transition of care at OU-TFM showing mixed results. The TCM qualifying patient visits did increase representing improved follow-up, but overall billing did not increase significantly. In 2019/2020, a QI project by Dr. Moore showed that increased education and reminders on billing criteria lead to an increase in appropriate billing. We plan on focusing our next PDSA cycle on resident education on TCM billing. Some barriers we identified leading to low follow-up were socioeconomic barriers to transportation for our patients and the worsening of the pandemic throughout the course of our project.

ABSTRACT #40: DO NO HARM: PAIN AND OPIOID MANAGEMENT IN OKLAHOMA PRIMARY CARE

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Introduction: Opioid use and misuse is the leading driver of drug overdose deaths in the US. In 2018, synthetic opioids, other than methadone, were involved in 46,802 overdose deaths. Oklahoma is not immune to these challenges—opioid prescription rates have been on the decline since 2012, yet remain far above the national average. Over 2,500 Oklahomans have died due to opioid-related drug overdoses since 2013. To address these concerns, the Oklahoma Department of Mental Health and Substance Abuse Services (ODMHSAS) partnered with University of Oklahoma's Oklahoma Primary Healthcare Improvement Cooperative (OPHIC) to develop, implement, and evaluate a dissemination program aimed at increasing adherence to evidence-based pain and opioid management guidelines in primary carepractice.

Methods: The Do No Harm Program (DNH) enrolled 73 primary care practices throughout Oklahoma—78% (n=57) completed the program despite challenges encountered with the COVID-19 pandemic. Participating practices received academic detailing, in-practice facilitation, technology support, performance feedback, and sharing of best practices. Prescription Monitoring Program-generated quality measures were monitored and evaluated pre and post intervention. Descriptive analyses were used to evaluate the dose, frequency, and duration of intervention. Baseline practice self-assessments, implemented to prioritize quality improvement interventions, were evaluated. Wilcoxon signed-rank tests were used to evaluate pre versus post program quality measures.

Results: On average, practices participated in the program for 16.5 months. DNH conducted 1,461 in-person visits to practices of which 43% (n=627) were for practice facilitation and 7% (n=100) were for academic detailing. The remaining visits were conducted to recruit practices, complete enrollment paperwork, and extract EHR data. Additionally, 18 academic detailer visits were conducted virtually during the COVID-19 pandemic. Only half of practices (46%) reported using a chronic pain assessment protocol either most or all of the time and a third (32%) reported using a multi-modal pain plan protocol either most or all of the time. The most frequently selected priority for participating practices was to integrate multi-modal pain plan protocols. There was a statistically significant decrease in the proportion of patients receiving chronic opioids with a morphine milligram equivalents per day (MMED) >90 from 2017Q1 (mean=0.08, SD=0.14) to 2019Q2 (mean=0.04, SD=0.09), $p<0.001$. Further analysis of DNH's impact is ongoing.

Discussion: These findings provide a preliminary look at the design and impact of a dissemination program to improve pain and opioid management in primary care. Intervention priorities were easily identified and improvement in opioid prescribing patterns suggest promising benefit from program expansion.

ABSTRACT #42: ADDRESSING AND IMPROVING ADHERENCE TO VACCINATION RECOMMENDATIONS FOR CHILDREN WITH HIV INFECTION

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Introduction: Centers for Disease Control and Prevention (CDC) recommendations for immunization of children with HIV infection vary from the recommendations for the general population. For example, the pneumococcal polysaccharide (PPSV23) and meningococcal ACWY (MenACWY) vaccines are indicated at an earlier age, the human papillomavirus (HPV) vaccine requires an extra dose, and there are specific catch-up immunization recommendations for Haemophilus influenzae type b and pneumococcal conjugate vaccines. Data on adherence to these recommendations in primary and specialty care settings is scant. The primary objective of this quality improvement (QI) project was to assess and improve immunization rates for these vaccines in children with HIV infection receiving care from the OU Pediatric Infectious Disease clinic in Tulsa. The secondary objective was to assess and improve immunization rates for all age-appropriate vaccines in this group.

Methods: In this QI cycle, we reviewed vaccination records and offered the CDC recommended vaccines during each patient's quarterly follow-up visits in the clinic. We utilized the Oklahoma State Immunization Information System (OSIIS) as the primary source for evaluating immunization records. When inadequate, we utilized additional immunization records supplied by the patient. We provided the incomplete immunizations, offered counseling in cases of vaccine hesitancy, and updated OSIIS after vaccine doses.

Results: Baseline review of immunization records from our cohort (n=13, ages 6–14) revealed that 46% (n=6) had not received any doses of PPSV23 or MenACWY, 23% (n=3) were incompletely immunized with one or both vaccines, and 31% (n=4) were fully immunized with only one of the vaccines. No patients were fully immunized with both vaccines. Additionally, none of the patients had completed a 3-dose series of the HPV vaccine. Immunizations with vaccines recommended for the general pediatric population were up-to-date in 69% (n=9), missing or incomplete for ≤3 vaccines in 23% (n=3), and missing or incomplete >3 vaccines in 8% (n=1). Among the cohort, a total of 43 missing/incomplete vaccine series were identified at baseline. Since implementation, 31 vaccine series have been completed with eight in progress, and four still requiring intervention.

Discussion: Higher immunization rates for the generally recommended vaccines compared to the vaccines recommended for patients with HIV infection could suggest a lack of knowledge among providers regarding immunization recommendations for these patients. Assessing the immunization rates of children with HIV infection at other institutions or children with other special vaccine needs at our institution can provide invaluable information and improve care.

Social/Behavioral

ABSTRACT #10: DOES A COMPASSION FATIGUE CURRICULUM IMPROVE PROFESSIONAL QUALITY OF LIFE AND HOPE?

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Introduction: Evidence-based interventions to mitigate the impact of secondary traumatic stress (STS) are lacking. As such, a 12-month curriculum was created for professionals at-risk for developing STS. It was hypothesized that the implementation of a psychoeducational curriculum would lead to a decrease in burnout, and STS, and an increase in compassion satisfaction and hope in participants.

Methods: A prospective study was conducted evaluating the impact of a compassion fatigue curriculum on professional quality of life and hope in social workers from OU-Tulsa clinics, and attorneys from Legal Aid Services of Oklahoma. Hour-long courses for each group were held monthly, and followed a curriculum developed by the investigators, which included The Compassion Fatigue Workbook.

Surveys were administered prior to the first class, at the mid-point, and after the final class. Surveys included basic demographic information as well as The Professional Quality of Life Scale (ProQOL), and The Dispositional Hope Scale. Since data approximated the normal distribution, a repeated measures ANOVA was conducted for each measure for each cohort separately in SPSS (version 26).

Results: Respondents to the initial survey (n=18) were 95% female and part of social work (n=11) and legal aid (n=7) cohorts. By the study's end-point survey, respondents reduced to seven social workers and four attorneys. For those individuals who responded to each survey (n=11), end-point STS decreased for social workers from an initial 23±7.9 (average level) to 17.7±4.8 (low level) ($F(2,12)=6.48$, $n=7$, $p=0.01$), with no change for attorneys (initial: 28±4.1 (average), end: 29.8±3 (average), ($F(2,6)=1.79$, $n=4$, $p=0.25$)). At the beginning and end of the study, compassion satisfaction was high for social workers, and was average for attorneys, with both cohorts exhibiting no significant change. Burnout also did not significantly change after the program; on average, social workers had low levels of burnout and attorneys had average levels of burnout (both at the beginning and end of the study). While not statistically significant, hope increased slightly for both social workers and attorneys.

Discussion: The results yielded a statistically significant improvement in STS scores for social workers. While compassion satisfaction was high and burnout low for social workers within the study's cohort, a psychoeducational curriculum may impact high STS observed in helping professionals. The investigators plan to continue this work with other professionals deemed at-risk for developing STS.

ABSTRACT #11: CLUSTER ANALYSIS AS A MORE PRECISE MEASURE OF BURNOUT AMONG HEALTHCARE PROVIDERS

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Introduction: Burnout among physicians and medical trainees has been heavily investigated in the last decade, given its high prevalence and implications on poor patient outcomes. However, physician burnout, widely assessed via abbreviated versions of the Maslach Burnout Inventory (MBI), has previously ignored the multidimensional properties of this psychometric measure. This study aims to identify distinct burnout "clusters" among academic medical professionals and trainees based on MBI subscores.

Methods: This secondary data analysis was conducted using a large dataset from the 2019 OUSCM's well- being survey, including the MBI with subscores. Using a new analytic approach recommended by creators of the MBI, we performed additional Two-step cluster analysis on the dataset to better characterize our population. Two-step cluster analysis in SPSS was utilized to analyze mean values of the three MBI subscales and to understand similarities, differences, and clusters within the dataset.

Results: Burnout subscores from 272 participants were analyzed. Sample demographics included: mean age 39, 81.3% female, 77.9% white, 20.8% faculty, 55.8% staff, 11.6% residents, and 11.9% students. Preliminary results of cluster analysis indicated two distinct clusters, with good cluster quality, while subsequent analysis revealed 3-, 4-, 5-, and 6-cluster models all with fair cluster quality. Investigators found the 4-cluster model most consistent with existing literature, identifying the following distinct clusters: 1) respondents scoring high in cynicism and exhaustion, with low efficacy, 105 (38.6%); 2) respondents scoring high in both exhaustion and efficacy, 62 (22.8%); 3) those scoring high in efficacy, with low cynicism and exhaustion, 58 (21.3%); and 4) those scoring low in all areas, 47 (17.3%).

Discussion: The emergent four-cluster pattern is consistent with preliminary cluster analysis on burnout subscores among mental health professionals, and this method identifies individuals who share similar patterns of burnout subscores, previously considered outliers. Identifying specific dimensions of burnout within a population provides greater understanding of how individuals experience burnout and how their environments contribute to burnout. Extending cluster analysis to samples from multiple academic medical institutions would validate the identification of burnout clusters and provide evidence for the development of more precise interventions to mitigate burnout among medical providers and trainees.

ABSTRACT #13: FINDINGS FROM A NUTRITION NEEDS ASSESSMENT OF INDIVIDUALS AFFECTED BY HOMELESSNESS

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Introduction: In Tulsa, the prevalence of individuals experiencing homelessness has risen over the past ten years. Health disparities within this population are frequently exacerbated by limited access to healthy and fresh foods, resulting in high rates of emergency department utilization. Soup kitchens, food pantries, and shelters serve as a food safety net to prevent hunger with less emphasis placed on meals for preventing or managing chronic illnesses. Iron Gate, Tulsa's largest stand-alone soup kitchen, served more than 290,000 meals in 2020 with demand rising 25% since the COVID-19 pandemic began. This study describes a nutrition needs assessment of guests accessing Iron Gate Tulsa's soup kitchen to identify opportunities for addressing nutrition-related health disparities through a "food as medicine" transformation of Iron Gate's prepared meal program.

Methods: With input from Iron Gate as the community partner, we developed a 13-item survey to assess nutrition-related health needs, dental issues, food preferences, and meal satisfaction of Iron Gate guests. Surveys were administered via interview to unsheltered adults at an Iron Gate morning meal service. A self- administered version of the survey was also distributed on the same day with an Iron Gate lunch meal served at the temporary overflow shelter. Additionally, we conducted weighed food nutrition analysis of 7 randomly selected Iron Gate meals to estimate macro- and micronutrient composition of meals. Descriptive statistics were calculated using SPSS v.27 and meals were analyzed using Nutritionist Pro.

Results: We collected 114 surveys and excluded one due to age <18 years and one that was returned blank. Most respondents had at least one chronic health condition with the most prevalent self-reported conditions being depressive disorder (50.9%) and cardiovascular conditions (49.1%). While most guests indicated overall satisfaction with Iron Gate meals (67.6%), the addition of more fruits (95.8%) and vegetables (97.1%) at mealtime was desired by most respondents. Results from the menu analysis revealed opportunities to lower meal content of sodium, saturated fat, and added sugars and to raise micronutrient and omega-3 content to better align with guidelines for mental and cardiac health.

Discussion: Survey findings are consistent with other studies assessing nutritional risks in populations affected by homelessness. Nutrient gaps identified in the menu analysis also reflect dietary intake deficiencies described in other studies of this high-risk population. Hunger safety net providers serving people affected by homelessness can play a major role in meeting critical nutrition needs, particularly those for optimizing cardiovascular and mental health.

ABSTRACT #15: EXPECTATIONS: DO THEY MATTER ON A NONPROFIT BOARD?

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Introduction: This study explores whether the expectations people have for joining a nonprofit board influence their satisfaction with board participation. In addition, it seeks to discover whether those expectations differ by race, gender, age, or lived experience with poverty.

Methods: We sent a quantitative on-line survey to 600 board members across the United States. These board members were part of a national organization called Family Promise and represented their individual local affiliates. Survey questions were designed using existing literature regarding reasons for board membership. We looked for correlations with the amount of time spent on board activities, overall satisfaction, and whether a person is considering resigning. We removed personal identifiers.

Results: We received 561 responses. Respondents were predominantly female (59%), and 142 (31%) had lived experience with poverty. Twenty-eight percent of respondents were people of color. The majority (61%) were over fifty-five. "To make a difference", "to address a specific problem" and "to provide a different perspective for a board to consider" were the highest ranked reasons respondents chose to serve on a non-profit board. Respondents reported overall satisfaction with board involvement as high (1.7 on a five-point Likert scale, sd=0.7).

We used Kruskal Wallis non-parametric tests to compare rankings of the most important reasons board members serve. Men ranked "influencing an organization's decisions" (p=.001), and "addressing a specific problem" (p=.008), higher than women, whereas women and 35-44 y/o people ranked "making professional connections" higher (p=.001). Older board members (55+y/o) ranked "bringing funding to the organization" significantly higher than younger members, while younger members (<35y/o) ranked "providing a different perspective" (p=0.002) higher than older members. Race and lived experience with poverty did not significantly impact findings.

We performed a stepwise multivariable linear regression analysis to determine which variables predicted respondent's board satisfaction. Seven characteristics were significant independent predictors, including "valued perspective" (B=.079, p<.001), "board social time" (B=.034, p<.001), "addressing a specific issue" (B=.065, p=.001), "age" (B=-.027, p=.001), "making a difference in mission furtherance" (B=.040, p=.005), "board membership numbers" (B=-.038, p =.003), and "connecting socially" (B=.020, p=.026)

Discussion: Findings indicate the intertwining of expectations and satisfaction when age and gender are factored in. When expectations are met, people express satisfaction and are more likely to complete their time of board service. As nonprofit boards seek to increase diversity in membership, future research focused on the influence of expectations for targeted groups may be useful for ensuring successful integration.

ABSTRACT #21: RACIAL DISPARITIES IN NATIVE AMERICANS AND AFRICAN AMERICANS UNDERGOING AMPUTATION IN OKLAHOMA

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Introduction: Studies have documented that African Americans (AA) with diabetes (DM) and/or peripheral arterial disease (PAD) have higher rates of amputation in comparison to their Caucasian American (CA). However, there are limited studies that have analyzed amputation rates in Native Americans (NA). As Oklahoma (OK) has the largest number of NA, the objective of this study was to determine if NA in Oklahoma have worse outcomes compared to whites, defined as major amputations for patients with DM and PAD.

Methods: We performed a one-year (2017) preliminary analysis of the Oklahoma State Inpatient Database and included all patients with PAD and/or DM. Patients undergoing amputation for trauma, patients with home zip codes identifying them as out-of-state, as well as patients missing critical variables were excluded. Patients were stratified based on race (NA, AA, and CA). The primary outcome was the incidence of major amputation (below- or above-knee) and to determine if racial disparities exist amongst the groups.

Results: A total of 136,358 patients with PAD and/or DM were included of which 1% (n=1394) underwent amputation. Of this group, 65.6% of patients had DM and 53.6% had PAD, 71.3% were > 60 years old, and 50.3% were males. NA were more likely to undergo amputation compared to CA (13.9% vs 7.3%, p=0.001). Furthermore, both NA and AA were independently associated with increased risk for amputation (1.4[1.1-1.9], p=0.02 and 1.6 [1.3-2.2], p=0.04).

Discussion: In this analysis, American Indians had a higher incidence of major amputation. Also, the analyses showed that there are racial disparities among this population of patients. Further studies are needed to increase understanding and build strategies to improve the health of American Indians. Moreover, additional research is required to identify strategies that address the specific needs of the American Indian Community.

ABSTRACT #39: FACTORS ASSOCIATED WITH PERCEIVED RELEVANCE OF TRAUMA-INFORMED CARE TO HEALTHCARE PRACTICE

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Introduction: Adverse childhood experiences (ACEs), a major type of trauma, have emerged as important predictors of myriad adverse health outcomes later in life. Trauma-informed care (TIC) entails understanding the health effects of trauma, patient-centered care, interprofessional collaboration, and recovery pathways. There is a need for frameworks to guide the development of TIC training for healthcare professionals (HCPs). Snyder's hope theory may be one such framework because of its focus on goal-oriented cognitions. This study's aim is to evaluate a model with knowledge of ACEs and hope as predictors of HCPs' perceived relevance of TIC to practice.

Methods: We recruited clinic employees (N=571) comprising administrative and nursing staff, non-physician providers, physician faculty, and resident and fellow physicians from OU Physicians to participate. In total, 194 eligible participants completed the study survey. The survey contained questions related to demographic and practice characteristics, knowledge of ACEs and TIC and their impact on health outcomes, and relevance of TIC to practice as well as a modified version of the Adult Hope Scale (AHS) and the ACEs survey.

Results: Hope and its pathways and agency thinking subscales as well as knowledge of ACEs were similar for most of the respondents ($p > .05$). Relevance of TIC to practice differed by department [$F(7, 157) = 4.68$, $p < .001$]. We found significant positive correlations between agency thinking and TIC relevance ($r = .252$; $p = .001$), between agency thinking and ACEs familiarity ($r = .295$; $p < .001$), and between ACEs familiarity and TIC relevance ($r = .451$; $p < .001$). Hierarchical regression analysis demonstrated relevance of TIC to practice significantly interacted with respondent characteristics (i.e., years in health care, healthcare position, and department) ($\Delta R2 = .348$, $p < .001$) at Step 1. At Step 2, knowledge of ACEs and health outcome was a significant predictor ($\Delta R2 = .074$, $p < .001$). At Step 3, agency thinking was a significant predictor ($\Delta R2 = .020$, $p = .003$). In the final model, the predictors accounted for about 46% of the variance in TIC relevance [$F(13, 149) = 6.11$, $p < .001$].

Discussion: Our findings support a framework for developing TIC training for HCPs that integrates education about the health effects of ACEs and leverages agency thinking (i.e., internal driver of goal pursuit) in learners. Hope-informed training in TIC could include skill-building in patient-centered assessments, counseling, collaborative treatment-planning with ACEs-affected patients, and attending to HCPs' trauma histories.

ABSTRACT #41: FOSTER PARENT ATTITUDES AND THEIR ASSOCIATION WITH HOPE, PERCEIVED STRESS, AND FLOURISHING

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Introduction: Few studies have assessed foster parent experiences, and their attitudes towards the foster care system, the children they foster, and their biological parents. The aim of this study was to assess the relationship between Foster Parent Attitudes Questionnaire (FPAQ) scores and hope, perceived stress, and flourishing scores. We hypothesized that caregivers with higher FPAQ scores, indicating positive attitudes towards the foster care system, children, and their biological parents, would also have high hope, low perceived stress, and high flourishing scores.

Methods: Surveys were administered to families with children in foster care at the OU Fostering Hope pediatric clinic in Tulsa, OK. The survey included: the FPAQ, Perceived Stress Scale (PSS), Dispositional Hope Scale, Flourishing Scale (FS), demographic information, and questions related to the COVID-19 pandemic, and nationwide protests for racial equality. Anomalous (n=2) and extensively incomplete surveys (n=5) were excluded from analysis.
SPSS was used for calculating descriptive and inferential statistics. For each scale, the distribution of responses was examined and Pearson or Spearman's correlations were run.

Results: Surveys from 40 respondents were analyzed. The majority of respondents were White (n=27, 68%), non- Hispanic (n=37, 93%), and female (n=37). Half of respondents fell within the age category of 25–34 years. Most foster placements were traditional (n=25, 63%). As expected, Hope and PSS were moderately negatively correlated (r=-0.37, p=0.02, n=37). Surprisingly, Hope and FPAQ totals were also moderately negatively correlated (r=-0.43, p=0.01, n=33). FPAQ was also negatively correlated with FS (rs=-0.47, p=0.01, n=33). The majority of respondents (65%) indicated that the COVID-19 pandemic had made parenting more stressful; responses ranged from "slightly agreed" (n=10) to "agreed" (n=9) to "strongly agreed" (n=7). Responses to a question regarding the impact of protests for racial equality were positively correlated with PSS (rs=0.33, p=0.04, n=38).

Discussion: For the current study, the FPAQ may not be an adequate measure to assess the experiences of foster parents; however, the other measures may be valuable tools for future research. Foster parents are a resource that many places in the US are severely lacking; however, little has been done to systematically assess their experiences and attitudes regarding the foster care system, the children they foster, and their biological parents. In order to improve existing systems, further research is still needed.

ABSTRACT #125: THE GENERATIONAL EFFECT OF ACES ON CHILDHOOD OBESITY

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Introduction: Childhood obesity has drastically increased over the last few decades. Adverse Childhood Experiences (ACEs) play a significant role in child and adolescent obesity; however, limited research has focused on the intergenerational effects of ACEs. Our study focuses on the relationship between parental ACEs and childhood obesity, hypothesizing a positive correlation between the two based on the current literature on this topic.

Methods: Data was obtained from 52 pediatric patients and their parents who visited OU-Tulsa pediatric clinics. Obese patients from OU's Early Lifestyle Intervention (ELI) and normal weight patients from General Pediatric Clinic (GPC) were identified through electronic medical records and reviewed based on the eligibility criteria. Due to barriers obtaining patients from ELI, obese patients were later recruited from the GPC. Obesity was defined as a BMI ≥ 95%, and normal weight was defined as a BMI of 5-84%. Parental ACE scores were determined by a self-administered questionnaire given to one parent. Univariate and multiple logistic regression examined associations, and odds ratios (OR) and 95% confidence intervals (CI) are reported.

Results: Total participants (n=52) were non-obese (n=24) or obese (n=28). Mean age of the children was 8.6 (±3.8) years, 54% of whom were male. Median (min, max) ACE score of the parents was 1 (0, 9) and more than 42% had 2 or more ACEs. Parents of the children with obesity had significantly lower median ACE scores (p=0.0426). Parents of the children with obesity had significantly lower odds of having >2 ACEs than non-obese children (aOR: 0.18, 95%CI: 0.04, 0.98).

Discussion: The results contradict our hypothesis that parents of children with obesity would have higher ACE scores. Instead, we observed lower scores from parents of children with obesity. This novel outcome underscores other possible underlying causes for this negative correlation, such as the potential link between the socioeconomic status of parents with higher ACE scores and the lack of access to adequate nutrition for their children. It is also imperative to note that the results could be due to the study limitations, such as small sample size and only one parent answering the survey. Also, the majority of obese patients were recruited from ELI, where the parents are proactive about seeking treatment for their children, and that higher executive function may be attributed to lower ACEs. Future research should include larger sample sizes, and further consideration of the ethnicities of the population.