University of Oklahoma-Tulsa Research Forum 2018

Book of Abstracts

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BIOMEDICAL

DOES INCLUSION OF A CERTIFIED DIABETES EDUCATOR EFFECT GLYCEMIC CONTROL IN PREGNANT WOMEN RECEIVING CARE IN A UNIVERSITY BASED PRENATAL CLINIC?

Abstract ID: 69

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Background: The incidence of diabetes in pregnancy has increased with increasing maternal obesity in the United States. Uncontrolled diabetes in pregnancy is associated with well described adverse outcomes. The American Diabetic Association and the American College of Obstetrics and Gynecology recommend inclusion of nutrition education and lifestyle interventions in the management of pregnant women with diabetes to prevent fetal and neonatal adverse events. Crowther et al in 2005 and Landon et al in 2009 demonstrated that diabetes treatment (dietary advice, blood glucose monitoring, and insulin therapy) reduces the incidence of large for gestational age infants and macrosomia. Standards have been established for frequency and timing of glucose monitoring and the initiation of insulin therapy.

Objective: In pregnancies complicated by diabetes, we sought to compare the effectiveness of formal patient education by a Certified Diabetes Educator (CDE) to education provided by medical assistants (MA) with informal training using infant birthweight as a surrogate marker of glycemic control.

Materials and Methods: A retrospective chart review of pregnant patients with preexisting and gestational diabetes was performed using data collected on patients from the University of Oklahoma- Tulsa electronic medical record. MAs provided nutritional and lifestyle counseling during the first 31 months of charts reviewed and CDEs provided this counseling during the last 19 months. The primary study outcome was a significant decrease in birth weight stratified by gestational age in neonates of women who attended diabetes education sessions with CDE.

Results: 432 charts between January 2013 through February 2017 were reviewed. In women receiving formal CDE, the overall percentile birth weight decrease was 0.6% with a 2% birth weight decrease in term pregnancies. No statistically significant difference in birth weight was found between the two cohorts when stratified by gestational age, diabetes type, or number of CDE sessions. Secondary analysis of diabetes education effect on hemoglobin A1c levels showed no significant improvement.

Conclusion: Addition of CDE therapy to existing medical therapy did not significantly improve maternal glycemic control compared to education provided by informally educated medical assistants when using infant birth weight as surrogate marker compared to control population. This may be due to insufficient number of patients with diabetes who received CDE (75 patients) compared to the patients who did not receive CDE (375 patients), which occurred due to timeframe of data collection. Additional data collection and stratification by maternal BMI may further clarify this question.

DOES MORPHOMETRIC EVALUATION OF DAY FIVE HUMAN EMBRYOS PREDICT PREGNANCY OUTCOME?

Abstract ID: 29

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Introduction: The incidence of infertility in America is about 16%. Gardner and Schoolcraft described a method for grading the embryo prior to transfer. Several studies have attempted to answer the question if this grading system correlates with implantation or pregnancy rate. However, there are limitations to each of these studies, and this question remains unanswered.

Methods: We have performed a retrospective observational cohort chart review of embryos located in a single clinical site with a consistent laboratory site and practices. 241 patients were determined to be eligible for the study. A total of 456 embryos were transferred and analyzed.

Results: We did not find a statistically significant predictive value for any component of the embryo grade for either pregnancy as confirmed with a positive quantitative HCG and pregnancy with delivery. The blastocyst development stage component of the grading scheme approached statistically significant in its correlation with pregnancy with delivery. We analyzed the data for confounders and other trends including infertility diagnosis, ovulation induction agent, and BMI.

Discussion: A simple and cost-effective method for evaluating which embryos will result in pregnancy would be useful in the clinical setting. We were unable to find any component of the embryo grading scheme that predicted pregnancy reliably. Other studies may be needed to fully evaluate this method of embryo selection. Other embryo selection options should also be considered.

FINE-TUNING SEED PLACEMENT AND FORMATION IN BRAIN, A DATA DRIVEN APPROACH

Abstract ID: 51

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Background: Resting-state fMRI is among most popular approaches to study the human brain. To reduce the complexity of studying the human brain, only parts of the brain "seeds" are used to examine their interaction with other brain parts. The literature relies on a pre-defined location for these seeds (hypothesis-based), which depends on the previous works, hypotheses, and observations. Also, the suggested seeds shape from literature utilize a spherical shape with different radiuses. However, such rigid seeds formation ignores the tissues and brain anatomy. Moreover, seed locations depend on assumptions that might not be applied to new studies and thus many discoveries might be overlooked due to those assumptions.

Methods: We adopted multivariate distance matrix regression (MDMR) analysis (Anderson (2001); Shehzad et al. (2014)), a data-driven and hypothesis-free approach to performe comprehensive voxel-wise resting-state connectivity alteration between our study conditions. MDMR was applied to fMRI data from a novel study and first of its kind conducted at Laureate Institute for Brian Research. The study examines the effect of floatation therapy on healthy subjects as a potential intervention for reducing anxiety. 46 subjected were recruited for the study and then were randomly divided into two groups. The first group did a normal flotation session (90 mins), while the second group did a zero-gravity chair condition for the same duration (control group). For each group, we did a pre resting-state fMRI scanning. After three sessions, we did a post scanning fMRI. After applying MDMR on the data, we conducted group-by-time interaction analysis using 3dANOVA (AFNI). Then, a clustering analysis was applied to the data to unravel, the statically significant brain regions. The exact procedure was applied to hypothesis-based seed.

Results and Conclusion: The MDMR-guided seeds were able to reveal the statistically significant brain locations that show the effect of the interventions. Moreover, our results compare hypothesis-based seeds to MDMR ones, where we have shown that hypothesis-based seeds fail to find the statically significant brain regions involved in the intervention. Also, our results emphasized on using tissue-like seeds rather than typical seeds as has been used in previous works. From the perspective of neuroscience, we were able to find a reduction in functional connectivity in two main hubs of default mode network (DMN): medial prefrontal cortex (mPFC) and the posterior cingulate cortex (PCC).

IMPROVE PATIENT SATISFACTION AND WAIT TIMES IN PRIMARY CARE

Abstract ID: 88

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Introduction: Previous research has shown a strong inverse correlation between patient wait times and patient satisfaction. The goal of our Quality Improvement (QI) project was to improve patient satisfaction by improving clinic wait times through a Plan-Do-Study-Act (PDSA) process.

Methods: This study was conducted at a Federally Qualified Healthcare Center (FQHC), in a major city in the Central United States. We conducted a fishbone analysis or cause and effect diagram to graphically display causes that might be slowing down our patient's wait time and we identified the following areas of concern: lack of readily available Spanish interpreters, lack of preparation for procedures, as well as poor communication between clinic staff.

Data was collected from established patients at baseline and after implementation of each intervention. For baseline data, each patient was provided with a card for recording the following time-intervals by a staff member: check in, roomed, initially seen by physician, check out. Additionally, the patient was asked to rate their satisfaction of the timing of their visit using a 5-point Smiley Face Likert Scale at checkout.

The intervention was developed based on information gathered through the fishbone analysis. The intervention initiated daily pre-clinic huddles where staff were educated on and gathered appropriate materials for upcoming procedures. We also increased the number of Spanish interpreters by one per clinic session.

Results: Baseline data (N=16) showed that the average wait time for patients to see the physician after being roomed was 17 minutes, earning a patient satisfaction score average of 3.9 on a 5-point scale. After the first intervention (N=22) was in place, the average wait time for a patient to see the physician was reduced to 14 minutes, an 18% reduction, which also coincided with an increase in satisfaction score to 4.3 on a 5-point scale.

Discussion: These interventions demonstrated an improvement in patient satisfaction scores as well as clinic efficiency as measured by average wait times. Saving an average of 3 minutes per office visit over the course of a 20-patient day, a provider could save 1 hour of time that could potentially be used to see additional patients. Pre-clinic huddle and increased availability of interpreters have been permanently integrated by our clinic team.

IMPROVING A1c ABOVE 9.0 IN AN AMBULATORY ACADEMIC CLINIC

Abstract ID: 40

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Introduction: Diabetes management can be challenging in the ambulatory academic setting due to multiple factors including the discontinuous nature of resident clinics and a patient population that experiences social disadvantages that frequently result in limited engagement in their health. In order to better serve our patients, we designed a quality improvement project aiming to decrease the percentage of patients with an HbA1c above 9.0 seen in the last year in the OU-Tulsa Internal Medicine practice by 50% within one year.

Methods: Patients were identified by using ICD-10 codes related to diabetes and narrowed down to those with an associated HbA1c of 9.0 or above. We performed a root cause analysis to identify some of the reasons patients have elevated HbA1c as well as generate ideas for improvement. Our project consisted of three PDSA cycles. The first PDSA cycle included a small sample of patients and consisted of calling patients and scheduling appointments for a standardized diabetes visit. Care managers and patient service representatives facilitated this cycle. For the second PDSA cycle, we created a diabetes check list to be used at a regular office visit in order to guide and standardize physician-patient interaction. For the third cycle, we added the diabetes standardized check list to the office visit note in the EMR, making it easily accessible to all providers in the practice.

Results: 39% of the patients diagnosed with diabetes and seen in the last year in the OU–Tulsa Internal Medicine practice had an HbA1c above 9% prior to the implementation of our project. The percentage decreased to 36% by the end of the project. We were not able to reach the 50% targeted reduction. The first cycle failed to get patients scheduled; only 10% of the patients targeted were seen for a "diabetes visit". The second cycle yielded disappointing results as the diabetes checklist was utilized less than 20% of the time at a regular office visit. We have not been able to measure the "diabetes quick text" utilization to date.

Conclusion: Management of poorly controlled diabetes in our patient population can be very challenging. We believed the creation of an easy-to-use check list would help clinicians target areas most fruitful in improving a patient's HbA1c but found securing physician use in the EHR difficult. Learning from this and other challenges experienced through this process can help us improve our future QI projects, clinic practices, and ultimately patient care.

IMPROVING ADOLESCENT DEPRESSION SCREENING RATES - A QUALITY IMPROVEMENT PROJECT

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Objective: Adolescent depression is a pervasive illness with significant morbidity and mortality that can extend into adulthood. The National Institute of Mental Health estimated approximately 12% of adolescents experienced an episode of major depression in the past year. This number may underestimate the prevalence due to lack of routine screening in outpatient pediatric offices. The AAP recommends annual depression screening using a standardized screening tool at well child checks. The goal of this project was to evaluate the impact of provider education on adolescent depression screening rates in the OU Pediatric Clinic.

Methods: A retrospective chart review of adolescent well child checks from 4 pediatric providers at an outpatient pediatric clinic over two years was completed. Adolescents were defined as patients 12 to 18 years old. Screening was considered adequate if a PHQ-9 or other validated screening tool was completed during the visit. Data collected included gender, language spoken, history of depression screening, and current or past psychiatric diagnosis. Adolescents with a current diagnosis of depression were excluded. In the first PDSA cycle, providers completed an education module providing a review of pediatric depression and AAP screening recommendations. A second PDSA cycle incorporated visual prompts into the provider's workflow, including EMR pop-ups and printed PHQ-9 for patients to complete prior to physician evaluation. Each cycle lasted 4 months. A retrospective chart review of the most recent 4 months following the intervention was completed and screening rates documented.

Results: Of the 95 charts reviewed, no adolescents had been screened for depression using a validated screening tool. Informal depression screening had occurred in 13% (12/95). Following the first cycle of provider education, the rate was 0% and 28% for the two attending providers and 100% for both resident providers. Following incorporation of visual prompts during PDSA cycle 2, the rate increased to 72% and 100% for the two attending providers and remained at 100% for the resident providers.

Conclusion: The screening rate for adolescent depression, fulfilling the AAP standard of care, is greatly improved if providers are visually reminded to screen appropriately and if screening is incorporated into their workflow without affecting work efficiency. Given that using validated screening tools is an AAP standard of care, pediatric outpatient offices should prioritize efficient practices to standardize depression screening during well child examinations.

IMPROVING BLOOD PRESSURE CONTROL IN AN ACADEMIC INTERNAL MEDICINE PRACTICE

Abstract ID: 57

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Introduction: High blood pressure is a well-established risk factor for stroke and heart disease. Treating hypertension in the primary care office is a complex process that involves a multidisciplinary team. We designed a quality improvement project aimed to increase the percentage of internal medicine patients seen in whose blood pressure is adequately controlled (defined as <140/90 mmHg) from 64% to 75% by May 2017.

Methods: Using the Internal Medicine Quality Dashboard (Dashboard) provided by medical informatics, we identified patients aged 18-85 years old with an active diagnosis of hypertension for at least 6 months and at least one clinic visit between July 1, 2015 and June 30, 2016. We defined uncontrolled blood pressure as that above 140/90. We chose this target to align with the CMS Clinical Quality Measures reports; however, in our clinic, hypertension is managed according to the JNC 8 recommendations. The Dashboard was used to monitor changes in the percent of patients with blood pressure in control throughout this project.

We mapped out the current process for measuring and treating high blood pressure to identify areas for improvement and found three: sub-optimal blood pressure measurement techniques, physician inertia in high blood pressure management, and insufficient follow-up of patients with hypertension. We created three PDSA cycles based on these areas. To improve the measurement technique, we recommended procurement of electronic blood pressure monitor devices. Nurses were trained in proper blood pressure measurement techniques. To overcome physician inertia and help improve follow-up of patients with hypertension we designed a "follow-up" protocol for residents to use.

Results: In July 2016, 64% of patients 18 and older with diagnosis of HTN were found to have blood pressures in control (below 140/90). In May 2017, that percentage had increased to 65%. Due to the minimal increase in improvement, we extended the project through January 2018 at which time we saw no additional improvement.

Conclusion: Improving blood pressure control requires a multidisciplinary approach that involves participation of providers and patients as well as clinic and administrative staff. Despite most changes being implemented towards the end of the project, and likely due in part to concurrent administrative changes, we were able to increase the percentage of patients with hypertension who had blood pressures in control but were unable to meet our goal of 75%. Failure to meet our improvement goal may be attributed to competing obligations of staff and providers and insufficient provider continuity.

IMPROVING COLON CANCER SCREENING RATES IN THE OUSCM INTERNAL MEDICINE PRACTICE

Abstract ID: 93

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Introduction: Current USPSTF guidelines recommend colon cancer screening beginning at age 50 until age 75. The CDC estimates that up to 1/3 of the population that are age-eligible for screening are not being screened. Our aim in the internal medicine practice was to increase colorectal cancer screening rates from 45% to 65% by May 31, 2017.
Methods: We identified areas for improvement by first mapping out the current process for colon cancer screening in our clinic. We utilized a three-step approach to improve the colon cancer screening rate. Our first PDSA cycle focused on identifying a colorectal cancer screening infographic to be used in patient encounters to explain the importance of the screening and the process of completing the test. The second PDSA cycle involved a faculty member educating residents and other providers regarding utilization of the prevention services form in the EHR. Concurrent with this step, standing orders for eligible patients were placed in their EHR, allowing nurses to order the test when appropriate. The final PDSA cycle focused on increasing awareness of the lack of colorectal screening in the clinic by addressing screening in the weekly huddles with nursing staff, residents, and attendings.
Results: Results were based on the monthly IM dashboard provided by medical informatics. In July 2016, our practice reported a colorectal cancer screening rate of 45% of patients eligible for screening. PDSA cycle 1 was initiated in September and results were examined in January 2017 when the clinic reported a colorectal cancer screening rate of 54%. In May 2017 the final results were collected and a rate of 44% was reported, representing a net 1% decrease in the screening rate.
Discussion: After lung cancer, colorectal cancer is the second leading cause of cancer death in both men and women in the U.S. Despite attempts to increase awareness in both patients and providers in our practice and facilitate ease of ordering for this screening test, we were unable to reach our goal of 65% of eligible patients screened for colorectal cancer. Interestingly, we experienced a net decrease in the screening rate over the intervention period. We may be able to attribute the decrease in screening to patient refusal to complete the test; data regarding the refusal rate was not collected. We are continuing to monitor the colorectal cancer screening rate in our clinic with hopes of increasing the rate over the coming months.

INCREASING AWARENESS AND COMPLETION OF MAMMOGRAPHY SCREENING IN THE ACADEMIC AMBULATORY PRACTICE

Abstract ID: 34

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Introduction: Breast cancer is the leading cause of cancer in women and the second most common cause of cancer-related death. Despite rigorous evidence supporting screening to decrease breast cancer mortality, many women are not regularly screened in a primary care office. We designed a quality improvement project with the aim of increasing breast cancer screening rates from 42% to 65% in the Internal Medicine Clinic by the end of the academic year.

Methods: Following the USPSTF guidelines on breast cancer screening we identified women age 50 to 69 years old who have been seen in our clinic in the last year prior to the intervention. Our intervention targeted eligible women who were overdue for their mammogram and included: 1) patient education on breast cancer screening, 2) resident training on how to update the EMR adult prevention form, 3) a new process for the nurses to order mammography, and 4) a protocol to monitor the completion of the order. We created a patient education document on breast cancer screening and posted it in the patient exam rooms. A faculty member trained all of the residents in the use of EMR and the prevention sheet. With clinic administrative support, we implemented a process to have nursing staff offer mammography to appropriate patients as a routine part of the clinic encounter. We worked with our referrals department to help monitor mammogram referrals, cancellations, reschedules, and completed screenings.

Results: In July 2016, we identified 1593 women age 50 to 69 seen at least one time in the year prior to intervention in our Internal Medicine Clinic. At baseline, 42% were up-to-date with breast cancer screening. At the end of our project in May 2017, 56% of eligible women had mammography screenings. Outcomes of women who became overdue during the one year intervention time are included in our final results.

Conclusion: Screening mammography is often delayed or missed due to physician, patient, and organizational factors. Barriers we encountered while implementing this project included: 1) an EMR with functional deficits that prevent the automatic capture of prevention reports, 2) lack of physician motivation to take the time and update the prevention sheets, and 3) a poorly functioning referral system that unfortunately has not been able to change. To successfully increase the mammography screening rate, it is necessary to ensure administrative leadership can allocate appropriate resources and support suggestions for process improvement.

INTERNAL MEDICINE PATIENT PERCEPTIONS AND USE OF E-CIGARETTES

Abstract ID: 91

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Introduction: In recent years, e-cigarettes have become increasingly popular; however, there are few studies that demonstrate safety, short- and long-term benefits or consequences, and rate of smoking cessation when using e-cigarettes as a cessation tool. This pilot study seeks to determine the prevalence and perceptions of e-cigarette use in a sample of patients in an internal medicine ambulatory teaching practice in Tulsa, OK. We hypothesize that patients who use e-cigarettes (vape) will consider e-cigarettes to be safer and have less long-term health risks than traditional cigarettes.

Methods: We developed a questionnaire measuring e-cigarette and traditional cigarette use, perceptions of the safety and health effects of e-cigarette compared to traditional cigarette use, and demographic variables. Patients with regularly scheduled visits were invited to participate regardless of smoking history. The survey responses were entered first into Excel where they were reviewed for entry error and coded then exported to IBM SPSS v.22 for analysis.

Results: We obtained surveys from 207 respondents. Of these, the majority were female (71.8%) and Caucasian (61.7%). About half (56.3%) reported having ever smoked and just under a quarter (24.6%) reported having ever vaped. 46.8% of respondents reported believing e-cigarettes are very bad for one's health, 43.2% reported believing e-cigarettes and cigarettes are equally safe for use, and 82.4% reported believing that vaping will have a negative impact on one's health.

There was no statistically significant difference in perceptions of safety when examining sex, ethnicity, or education level. Respondents aged 18-25 years were more likely to rate e-cigarettes as "much safer" than cigarettes than respondents aged 26-44, 45-64, or 65+ (p=0.35). There was a statistically significant difference among respondents who reported having ever vaped when asked, "How bad for your health do you think e-cigarettes are to use." Those reporting having ever vaped were more likely to report believing e-cigarettes were neither bad nor good or that e-cigarettes were not very bad to use (p<0.001).

Discussion: Our results indicate a greater-than-national-average percentage of patients have ever used an e-cigarette in our sample (24.6% OU; 12.6% adults in the U.S.[1]). Additionally, we found differences among some groups in the perception of safety of e-cigarettes in our internal medicine practice. Further study regarding e-cigarette safety, use, and patient/provider perceptions is warranted. Our findings demonstrate there are specific groups with whom intervention will be critical should longitudinal data regarding the safety and health effects of e-cigarette use become available.

LUNG CANCER SCREENING KNOWLEDGE, ATTITUDES, AND PRACTICES IN OUSCM INTERNAL MEDICINE

Abstract ID: 90

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Introduction: Lung cancer is the third most diagnosed cancer (58.3/100,000 people in 2014)[1] and is the leading cause of death in both men and women with 158,040 deaths in 2015[2]. The United States Preventive Services Task Force (USPSTF) issued a grade B recommendation for annual lung cancer screening using low-dose computerized tomography (LDCT) for adults aged 55 to 80 years who have a 30 pack-year smoking history and currently smoke or have quit within the past 15 years in individuals who are willing to undergo surgery and do not have a limited life expectancy. This project aimed to first assess internal medicine physician knowledge, attitudes, and practices regarding lung cancer screening and subsequently improve their knowledge of the screening criteria and order protocol with the hope of increasing lung cancer screening rates in the practice.

Methods: An eight-question survey was designed to assess the baseline knowledge of internal medicine faculty and resident physicians. A presentation was then given to educate the faculty and residents on the project aim as well as review the current lung cancer screening guidelines and demonstrate the proper way to order the recommended screening test in the EMR. An identical post-presentation questionnaire was administered after the presentation. The questionnaires also collected limited demographic information.

Results: Response rates for the pre- and post-test questionnaires varied by academic standing (faculty or resident) and by resident program year. 75% of our survey sample completed both the pre- and post-tests. The rate of correct responses for every question increased from pre- to post-test. The largest improvement was seen in the category of number of smoking years to qualify for screening with a 20.4% increase in the correct response. There was a statistically significant improvement in only one area: the number of respondents who currently ordered imaging for screening from pre- to post-test (p=0.05).

Discussion: There was a definite increase in correct responses in all questions, however, only one question showed a statistically significant improvement. Despite having only one statistically significant response, we anticipate the increase in correct responses will have a positive impact on lung cancer screening in the IM practice. We plan to further augment this project by identifying and resolving issues that prevent ordering the LDCT for OU IM patients.

MEDICATION REFILL: A PROJECT TO IMPROVE PATIENT SATISFACTION

Abstract ID: 85

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Introduction: Clinics across the country are continuously striving to improve patient satisfaction, and as such routinely review and revise processes to meet the needs of patients. The goal of this project was to identify the most common reasons for patient calls and to generate interventions to improve patient satisfaction on clinic responsiveness.

Methods: The project was conducted within a busy academic primary care clinic and used three cycles of Plan-Do-Study-Act (PDSA) to test interventions. The first PDSA cycle identified reasons for patient calls through staff tracking over a one week period (N=162). The next cycle tracked resolution of 50 consecutive refill requests and compared time needed to complete to written clinic protocols. The final cycle involved nurse callback to another set of 50 patients with refill requests to inform them of refill submission to the pharmacy. At that time patients were asked to participate in a 2-question survey, with the opportunity to provide feedback.

Results: The first PDSA cycle identified medication refills (29%) was the most common, followed by referrals (26%) and returning call from nurse/physician (21%). In our next cycle, we found that 76% of refills were completed in <24 hours, while 18% could not be processed, 4% had already been refilled, and 2% took >48 hours to refill. Survey results showed patients almost equally split between agree/strongly agree (52%) and disagree/strongly disagree (48%) in response to the two patient satisfaction questions: experience with getting refill request submitted and satisfaction with refill process. Patients expressed both positive and negative feedback including appreciation for receiving a nurse call back on their request and quicker resolution when the clinic called the pharmacy, compared to frustration with issues relating to fax, pharmacy, and delays in time to complete.

Discussion: After identifying the most common reasons for patient calls, various factors were examined to evaluate current prescription refill procedures. Clinic protocol states refill calls should be addressed within two business days; this is currently being met. The primary goal to develop interventions to the most common requests made by patients has brought to light other concerns within the medication refill process. The split found in the survey responses were likely due to vagueness of the questions. The next steps for this project include improving patient and system communications along with resolving medication refill potentially at the time of initial call. This may provide opportunities to change patient perception and improve overall satisfaction.

OUTCOMES AND OVERUSE OF HELICOPTER TRANSPORT FOR PEDIATRIC TRAUMA PATIENTS IN OKLAHOMA

Abstract ID: 61

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Background: Almost half the pediatric population in the United States lives over 50 miles from a Level I or II Trauma Center. As traumatic injury is the leading cause of mortality and emergency medical services (EMS) transport in pediatric populations, further studies are needed to assist in the development of data-driven protocols for triage and transport. We compared outcome differences between ground (GEMS) and helicopter (HEMS) transport of pediatric trauma patients in Oklahoma.

Methods: This retrospective study utilized the Oklahoma State Trauma Registry to identify trauma patients less than 18 years old who received direct transport from the scene of injury to an Oklahoma Level I or II Trauma Center between 2005 and 2014. Univariate analysis was used to compare patient demographics, injury type, Injury Severity Score (ISS), and outcomes. Impact of transport mode on in-hospital mortality was calculated by Cox regression analysis.

Results: Of the 4797 patients in the study group, 25.0% were transported by HEMS. Injury severity was, on average, greater for HEMS. Mortality prior to ED discharge was nearly the same (2.9% GEMS vs 2.7 HEMS). However, overall mortality was higher for HEMS (8.7% vs 6.5). A greater proportion of HEMS patients were transferred to the ICU (38.2% vs 23.8) and the operating room (23.2% vs 18.1). Median length of ICU and overall hospital stays were greater for HEMS patients (3 vs 2 days for ICU and 4 vs 2 days for total stay). Minor injury, as measured by an ISS <15, was observed in 49.9% of HEMS patients. When controlling for injury severity, age, and trauma type, the protective effect of HEMS transport on in-hospital mortality was not statistically significant (Hazard Ratio 0.79 [95% CI 0.62-1.01]).

Conclusion: Pediatric trauma patients transported by HEMS generally had more severe injuries and thus, frequently worse outcomes. The protective effect of HEMS transport on in-hospital mortality was not statistically significant when examining all transported patients. However, there may be a protective effect for specific subpopulations. Notably, nearly half of HEMS transports were for categorically mild injuries. These findings suggest that HEMS transport is currently being over-utilized. Further study is needed to better identify and prioritize patients that experience a clear benefit from HEMS transport.

PREDICTORS OF MORTALITY AFTER ELECTIVE VENTRAL HERNIA REPAIR

Abstract ID: 50

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Introduction: Ventral hernia (VH) is a common surgical problem and can present both as emergent and elective cases. Deciding between operative and non-operative management of a non-obstructive VH in a high-risk patient can sometimes be a challenge. The aim of this study was to evaluate national series of open and laparoscopic ventral hernia repair (VHR), and to assess factors associated with mortality after elective VHR.

Methods: In a retrospective analysis of 2008-2014 Healthcare Cost and Utilization Project - Nationwide Inpatient Sample (HCUP-NIS), we included all patients with main diagnosis of abdominal cavity hernia (except inguinal, femoral, and diaphragmatic), and a Diagnosis Related Group (DRG) code related to hernia procedures except inguinal and femoral. Elective and Laparoscopic VHR were identified. Factors associated with the same hospitalization mortality were analyzed using logistic regression multivariate analysis.

Results: A total of 103,635 patients were studied (mean age 57.3±15.3 years, 61.4% female). There were 14,787 (14.3%) umbilical, 63,685 (61.5%) incisional, and 25,163 (24.3%) other ventral hernias. 215 (0.2%) patients had gangrenous hernia contents. Operative procedures included 59,993 (57.9%) elective and 43,642 (42.1%) emergent VHR. Laparoscopic repair was performed in 21.3% of elective VHR versus 13% in emergent cases (P<0.001). Mesh was used in 52,642 (87.7%) elective VHR versus 27,734 (63.5%) emergent VHR (P<0.001). Mortality was 0.2% (n=135) in the elective and 0.6% (n=269) in emergent surgery group (P<0.001). In elective surgery group, mortality rates were equal among laparoscopic and open VHR (0.2%), while in the emergent surgery group, laparoscopic VHR had a lower mortality rate (0.4% vs 0.6%, P=0.028). In the entire cohort, the median (interquartile range) of length of stay was 2 (3) days in the laparoscopic group and 3 (3) days in the open group (P<0.001) with no significant difference in total hospital charges. Multivariate analysis of elective VHR showed that the following factors were associated with mortality during hospitalization: male gender (Odds Ratio(OR)=2.37), age>50 years (OR=1.96), congestive heart failure (OR=2.15), pulmonary circulation disorders (OR=5.26), coagulopathy (OR=3.93), liver disease (OR=1.89), fluid and electrolyte disturbances (OR=8.66), metastatic cancer (OR=4.66), neurological disorders (OR=2.31), and paralysis (OR=5.29).

Conclusion: VHR has a low mortality, especially when performed laparoscopically. When planning for elective VHR, higher mortality is to be expected in elderly patients with comorbidities such as congestive heart failure, pulmonary circulation disorders, coagulopathy, chronic liver disease, metastatic cancer, neurological disorders, and paralysis. VHR is common which may overestimate OR. Conservative management can be considered for high-risk subgroups.

PRIMARY CARE RESIDENT OFFICE VISITS: INCREASING THE PERCENTAGE OF LEVEL-4 CODES

Abstract ID: 86

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Introduction: Residents frequently under-code visits, contributing to lost revenue and inaccurate documentation of patient care complexity. National Medicare averages are 43% for Level-3 and 49% for Level-4 Family Medicine established patient visits. Before this project, OUFM coded more Level-3 than Level-4 visits in a coding audit. This study aimed to evaluate interventions to improve the billing of Level-4 visits at the OUFM clinic.

Methods: Baseline data [n=3,222 visits] was collected from the clinic dashboard by nine senior residents in an academic primary care setting from January-August 2017. The six-resident control group [n=1,658 visits] was compared to the three-resident intervention group [n=781 visits] from September 2017-January 2018. Barriers to appropriate coding were identified. These included resident knowledge, time for the attending physician to see the patient during the visit, identifying Level-4 criteria post-encounter, and fear of inadvertent fraudulent billing. Three Plan-Do-Study-Act (PDSA) cycles were implemented to address these barriers. For PDSA-1 from September-October, educational materials were given to residents during in-service training by the clinic Medical Director. PDSA-2 from November-December included a routine patient visit by the attending physician for office encounters (a Level-4 billing requirement). For PDSA-3 in January 2018, Level-3 and Level-4 billing criteria reference cards were distributed to the intervention cohort. Other types of billing codes were excluded.

Results: At baseline, January-August, the intervention group coded 26.2% (95% CI=23.5-28.9) of visits as Level-4, versus 31.1% (95% CI=29.2-33.0) by controls. Following PDSA-1, Level-4s were billed 62.5% (95% CI=57.4-67.6) by intervention group versus 36.1% (95% CI=32.2-39.9) by controls. After PDSA-2, Level-4s were billed at 49.5% (95% CI=42.4-56.6) by intervention group versus 35.2% (95% CI= 31.6-38.7) by controls. In PDSA-3, the intervention group increased to 59.5% (95% CI=53.2-65.7) versus 24.1% (95% CI=19.8-28.4) by controls.

Discussion: At baseline, Level-4s were billed in less than 1/3 of encounters. After PDSA-1, this sharply increased by more than double, to a comparable percentage with the Medicare national average. Improvement was sustained after PDSA-2 and PDSA-3 interventions, and was likely due to increased focus and awareness by residents. Dedicated training of providers in billing criteria in conjunction with other point-of-care interventions demonstrated improvement in the percentage of Level-4 codes. This is an important training tool for residents' future practice, and should be emphasized in primary care provider training. PDSA-4 is under development to implement clinic-wide billing reference cards and comparison of all resident data. Results will be shared with clinic leadership for discussion of financial impact.

RATES AND PREDICTORS OF SEIZURE ASSOCIATED HOSPITAL READMISSIONS IN PATIENTS WITH STROKES

Abstract ID: 45

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Background: Seizures are well known sequelae of strokes, however the national estimates of seizure related hospitalization in the post-stroke period are not known. We hope to find associations between various factors and post-stroke seizures in order to help shape better treatment guidelines for these patients.

Methods: The study population included patients from the 2013 Nationwide Readmissions Database (NRD) who were over the age of 18 years with a principal diagnosis of Subarachnoid hemorrhage (SAH) (ICD9 = 430xx), Intracerebral hemorrhage (ICH) (ICD9 = 431xx) and Ischemic stroke (IS) (ICD9 = 433x1 & 434x1). Subjects with a secondary diagnosis of arterio-venous malformation, brain tumor, or traumatic brain injury were excluded. Seizures were defined by ICD9 codes (345.0x-345.5x, 345.7x-345.9x,780.39). Cox proportional hazard analysis was used to assess the relative risk of rate of readmission with seizures for patients in the presence of selected comorbidities and potential confounders such as age, sex, and type of stroke.

Results: A total of 557,033 subjects met all eligibility criteria, of which 497,138 (89.3%) were admitted with IS; 43,579 (7.8%) with ICH and 16,316 (2.9%) with SAH. The overall estimated 1 year Kaplan-Meir seizure free rate (±SE) was 98.97; it was 99.14%, 99.32% and 98.46% in patients with ICH, SAH and IS respectively. After adjusting for potential confounders, independent predictors of readmission with seizure within 1-year included female gender (odds ratio (OR) 1.10, 95% confidence interval (CI) 1.04–1.17), age≤60 (OR = 1.14, 95 % CI 1.07–1.22), hemorrhagic stroke (ICH/SAH) (OR =1.47;95 % CI 1.36-1.58), seizure during hospitalization (OR = 17.24, 95 % CI 16.21–18.35) and sodium abnormalities during the hospitalization (OR = 1.40, 95 % CI 1.27–1.53).

Conclusion: Rate readmission of seizure after stroke within the first year is low and there may be residual confounding by severity. Our findings do not support a need for routine prophylactic antiepileptic drug use after a stroke, which is currently commonly practiced in many institutions across the country.

TRAUMATIZED RESIDENTS: AN INITIAL LOOK AT PTSD IN INTERNAL MEDICINE RESIDENTS

Abstract ID: 35

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Introduction: Current interest in physician wellness and burnout has largely excluded post-traumatic stress disorder (PTSD). Originally recognized in military personnel, PTSD has been documented in police officers, trauma surgeons, and other first responders[1]. Although not thought as likely to occur in primary care physicians, little data exists. Given the negative effects of PTSD on wellness, we sought to examine the prevalence of PTSD in internal medicine (IM) residents in the United States.

Methods: An online survey of 3,764 U.S. IM residents was conducted from September 2016 to May 2017 and yielded 473 respondents following an emailed invitation to participate. At-risk participants were identified using the four-question Primary Care PTSD (PC-PTSD) screen. Demographic, occupational, and work satisfaction risk factors were also assessed; occupational and work satisfaction variables were developed by the originators of the study. Results were analyzed using IBM SPSS v. 23.

Results: 466 of 473 IM residents representing all regions of the U.S. completed the PC-PTSD screen. 19.7% of respondents screened PTSD-positive (≥3 screening questions positive). There were no significant differences between demographic variables and screening positive for PTSD. Residents who reported 81 or more workhours/week on average were more likely to screen PTSD-positive than those who worked 80 hours/week or less ($p<0.001$). Residents who reported duty hour violations >1/week were more likely to screen PTSD-positive (20.0%, $p=0.001$). Although the majority of respondents reported having poor work-life balance, only 17.1% of respondents indicated unhappiness with their careers. Residents screening positive for PTSD were more likely to report poor work-life balance in 4 areas ($p<0.001$) than those not screening PTSD-positive. Additionally, residents who screened PTSD-positive were more likely to be dissatisfied with 9 measured workplace variables than those screening PTSD-negative ($p≤0.001$). Those who screened positive were also more likely to report feeling less satisfied with their jobs (85.1%, $p<0.001$) and unhappy with their careers (40.0%, $p<0.001$) than those who did not screen positive for PTSD.

Discussion: Increasing national efforts to improve physician and resident wellness highlight the need for understanding PTSD in residents. In this national study, residents screened positive for PTSD at strikingly higher rates than the general population (19.7% compared to 1 - 6.8%)[2,3]. Multiple work-life and work-related factors were found to be associated with screening positive for PTSD. Additionally, significant associations between positive PTSD screens and higher risk for components of burnout exist. Resident wellness improvement efforts need to recognize PTSD and its effects in physicians.

UTILIZATION OF A TEMPLATE TO INCREASE DIABETIC FOOT EXAMS

Abstract ID: 84

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Introduction: Diabetes is a complicated chronic disease affecting multiple organ systems. Managed inappropriately, it may affect microvascular and macrovascular systems. One well-known complication with potentially drastic consequences is diabetic peripheral neuropathy. Diabetes causes microvascular damage to blood vessels supplying the nerves. This decreases sensation to the feet, and may increase the incidence of injury that can ultimately lead to ulcerations, osteomyelitis and amputation. The project's goal is to utilize an EMR template to identify patients who have not received diabetic foot exams within the last year, to perform the exam if they have not, and educate patients on the importance of diabetes management.

Method: This Quality Improvement project was conducted in an academic primary care clinic using Plan-Do-Study-Act (PDSA) methods. All established patients seen by three senior residents from 2/1/2018-2/15/2018 with a diagnosis of type II diabetes and an HgA1c > 6.5% were selected. During clinic visits, the provider used a preexisting EMR template that addressed patient compliance with diabetes mellitus, hypertension and lipid medication regimens. This template prompts providers to include in their examination a diabetic foot exam and inquire about diabetic eye exams. There was no special training necessary for diabetic food exams, as this skill is learned in medical school.

Results: An EMR query by OU Physicians found that for all providers within the OUP-Tulsa network, the diabetic foot exam rate for 2017 was only 18%. Of the physicians involved in this project, 8% of their patient panel met inclusion criteria. During the study frame, 14 type II diabetic patients had a clinic visit, of which 4 (29%) already had a diabetic foot exam within the last year. Ten (71%) had not and thus were provided a diabetic foot exam during their visit. No abnormal foot exams were found during this two week period. All 14 patients received diabetic foot education and counseling.

Discussion: OU Physicians' low rate indicates that many providers are either failing to perform the exam or neglecting to document their exams appropriately. Our project found utilizing the EMR template helpful in identifying and prompting the provider to conduct diabetic foot exams when needed, increasing the likelihood of identifying diabetic complications. As such, we recommend more provider education on this template and continued monitoring of its use. In our clinic, we plan to introduce our project to our fellow providers, and educate them on its use and importance of screening for peripheral neuropathy.

EDUCATION

EARLY HEAD START DOSAGE: THE IMPORTANCE OF PARENT-CAREGIVER RELATIONSHIPS AND FAMILY ENGAGEMENT

Abstract ID: 25

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Background: Early Head Start (EHS) is a federally-funded child development and family support program for low-income families with pregnant women, infants, and toddlers up to age 3. EHS aims to promote young children's development and strengthen families through encouraging their engagement in the program. While EHS operates with no charge to families who meet income eligibility, considerable numbers of EHS children and families choose to leave EHS early, and this phenomenon is not yet fully understood.

Methods: The present study used the nationally representative dataset of children in EHS, the Early Head Start Family and Child Experiences Survey (n=915; Vogel & Boller, 2009-2012). This study examined whether child and family characteristics at EHS entry and parent-caregiver (i.e., home visitors or teachers) relationships at age 1 predict the dosage of EHS children experienced. Dosage was viewed in two ways: (a) leaving EHS early and (b) the length of enrollment in EHS. This study further examined the mediational role of family engagement during their time in EHS on the association between parent-caregiver relationships at age 1 and children's EHS dosage after controlling for child and family characteristics at EHS entry.

Results: Findings showed that parent-caregiver relationships perceived by caregivers, but not parents, at age 1 predicted lower rates of leaving EHS early. Furthermore, we found that children whose mothers had more demographic risk factors or whose family had low income-to-needs ratios or moved in the first year of EHS were more likely to leave EHS early. Parent-caregiver relationships perceived by both parents and caregivers did not directly predict the length of enrollment in EHS; however, other family characteristics were more associated with staying in EHS. In addition to family income-to-needs ratios and moving, children who were from an intergenerational family or whose mothers were pregnant when the study child enrolled in the program or whose parents had good physical health were more likely to show longer length of enrollment in EHS. Findings from the mediational models showed that positive caregiver-perceived parent-caregiver relationships were associated with the increased level of family engagement during their time in EHS, which, in turn, predicted lower rates of early leaving and longer length of enrollment in EHS.

Conclusion: In sum, the parent-caregiver partnership which may reflect a good relationship between parent and caregiver and a higher level of family engagement would be important factors to maintain children until their eligibility end, thereby maximizing the effect of EHS.

FAMILY MEDICINE RESIDENCY PROGRAM REDESIGN

Abstract ID: 83

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Introduction: Prior to the 2016-2017 academic year, Family Medicine Residents at the University of Oklahoma-Tulsa followed a traditional model with Continuity Clinic (CC) dispersed throughout rotations. The amount of time spent in the CC increased with each year of residency, and was rotation dependent. Beginning 07/2016, the post graduate year 1 (PGY1) residents moved to a 2+2 model that evenly divided time between CC and rotation. Starting 07/2017, all residents moved to this model with the goal of increasing resident satisfaction, and ultimately improving patient outcomes. OU-Tulsa is the first family medicine program to implement a 2+2 model.

Methods: In the new 2+2 model, residents spend 1/2 month solely in their CC followed by 1/2 month on rotation. This was started with incoming PGY1s in 07/2016, and expanded to all classes of residents in 07/2017. Residents filled out a modified Veteran's Administration Learner's Perception Survey (VALPS) to determine their satisfaction with the new schedule. The survey assessed satisfaction with a 5-point Likert scale over 4 domains: Clinical Faculty/Preceptors (CFP), Learning Environment (LE), Clinical Environment (CE) and Other. Residents were surveyed every 6 months starting in 06/2016. The sample size was too small to group residents by post graduate year, so changes in satisfaction were assessed across the 3 survey dates using a one-way MANOVA with $\alpha=0.05$ as significant.

Results: There were 18 participants in the 06/2016 baseline survey. For the 12/2016 (n=21) and 06/2017 (n=19) surveys, only the PGY1s were on the 2+2 model. For all residents, satisfaction with CFP had a mean of 3.13 in 06/2016, 3.95 in 12/2016, and 3.89 in 06/2017. Satisfaction with LE had a mean of 2.94 in 06/2016, 3.88 in 12/2016, and 3.89 in 06/2017. Satisfaction with CE had a mean of 2.72 in 06/2016, 3.25 in 12/2016, and 3.42 in 06/2017. The one-way MANOVA revealed a significant multivariate main effect across survey dates ($F_{3,47}=3.92$, $p=0.014$, Roy's Largest Root=3.92). CFP ($F_{2,48}=3.69$, $p=0.032$) and LE ($F_{2,48}=4.16$, $p=0.01$) were significant at the univariate level. Scheffe post-hoc analyses showed significantly higher satisfaction with LE in 12/2016 ($p=0.029$) and 06/2017 ($p=0.023$) compared with baseline (06/2016).

Discussion: Before the 2+2 model was implemented resident satisfaction in the learning environment, and with faculty was significantly lower. Although there is not a statistical difference in satisfaction with the clinical environment, each successive survey produced a higher mean in this area. Data analysis is currently being conducted on quality of care measures.

NEVER TOO EARLY: GIVING PROGRAMS AT TULSA COMMUNITY COLLEGE

Abstract ID: 60

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Background: Colleges and universities face increasing challenges in meeting budgetary needs. State and federal budgets decrease each year forcing institutions to increase tuition and search for other ways to offset rising costs. Value-added services and unique opportunities that attract students to an institution are often funded through the institution's development office or the foundation. Foundations rely on the generosity of individuals and local businesses and often struggle with costly campaigns geared toward a widely-varied audience of potential donors. As foundation offices expand the scope of potential donors to include students and parents, donation campaigns must also be expanded and revised to leverage relationships with these potential donors.

Methods: Peer-reviewed research conducted over 25 years analyzed characteristics of likely donors. Many research articles referenced a study conducted in 1992 which formed the basis of more recent studies. Recent studies found similar results even when adding other donor characteristics into the study. Research that excluded original characteristics was reviewed and concluded to be irrelevant to this proposal. Specific fundraising campaigns were designed for Tulsa Community College that would reduce campaign costs, eliminate unlikely donors, and increase the efficacy of each campaign. Fundraising campaigns were chosen based on simplicity of execution, value to building relationships, and bridging understanding between potential donors and the role of the foundation in educational activities.

Results: From literature reviews, three characteristics emerged as predictors of likely participation among alumni donors: (1) Brand identification or the way alumni identify themselves by their association to an institution, (2) Student satisfaction or the value a student places on his or her experiences with an institution. and (3) Student experience or interactions between students and staff, processes and activities in an institution. Student satisfaction and student experience correlated strongly with brand identification. All three characteristics correlated strongly with alumni giving.

Conclusion: An institution's relationships with students can affect alumni participation in donor campaigns. When students have positive experiences with an institution, they are likely to feel that their expectations are met and feel satisfied with those experiences thus developing brand identification with the institution. Institutions that actively develop positive relationships with students and maintain those relationships even after students leave the institution are more likely to have alumni participate in donor campaigns. Foundation offices that actively engage not only students, but also parents and alumni, can continue to maintain giving relationships over time.

PARENTING TODDLERS: CHALLENGES, INFLUENCES, GOALS, AND SUPPORT

Abstract ID: 67

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Toddlerhood places distinctive demands and challenges on parents with respect to the unique developmental needs of children, such as emergence of independence and communicative competence. In fact, toddlerhood (age 16-36 months) is one of the most challenging developmental periods for parents to cope with. It could be even more challenging for low-income parents of toddlers given their limited resources and support. Despite the recognition of the parenting challenges in this period, toddlerhood parenting has received less attention than that of infancy or the preschool period. This study employs qualitative methodology to explore the specific challenges, support, background influences, and goals for parents of toddlers and seeks to determine if there are differences between low-income and middle-class families.

We used qualitative data collecting methods that involved semi-structured interviews to study 38 middle-class and 32 low-income parents of toddlers. Each family unit comprised a father and mother figure that live with the toddler in the same household. Participating children also had at least some non-parental childcare experiences. We asked parents open-ended questions regarding goals, challenges, background influences, resources, and support. We then transcribed, cross-checked for accuracy, and coded the data. We identified codes, such as words and sentences (open-coding), sorted them into major themes, and found thematic/conceptual relationships between themes (axial coding). Interpreted data were reviewed and compared to each other until consensus on the concepts or themes was reached.

From the analysis, we found that there are many similarities between low-income and middle class parenting challenges (e.g., non-compliance, emerging independence, tantrums and difficulty keeping up with energy levels). However, we did find key differences in that low-income parents of toddlers reported more difficulty managing daily routines and expressed more personal barriers. Regardless of SES, parents used extended family, friends, and childcare as a major source of support, but low-income parents are more likely to use resources such as television and welfare. Low-income parents predominantly reported sending their child to college as a major parenting goal, while middle-class parents focused more on their child's well being. Religion and personal childhood experiences commonly influenced both groups of parents, however low-income parents tended to report more negative childhood experiences (e.g., fatherless life, harsh parenting) that has either positively or negatively influenced on their own parenting.

This study can guide practitioners in understanding unique aspects of parenting toddlers, and provide resources that are more pertinent and accessible to parents based on individual and socioeconomic needs.

PEDIATRIC RESIDENT RATE OF BURNOUT: TRENDS, PATTERNS, AND INTERVENTIONS

Abstract ID: 80

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Background: Our study seeks to trend the rate of burnout in Categorical Pediatrics Residency Programs compared to results from the 2016 Annual Study and determine if the rate of burnout at OU-TU SCM is consistent with nationwide results.

Methods: OU-TU School of Community Medicine (SCM) Pediatric Residency Program is a member of the Pediatric Residency Burnout Resilience Study Consortium 2017 Annual Study that includes 46 training programs in the United States. Last year, OU-TU SCM participated in the 2016 Annual Study. Infrastructure for this multicenter, coordinated study was derived from this Consortium and with the assistance of the Association of Pediatric Program Directors Longitudinal Education Assessment Research Network (APPD LEARN) for surveying and data analysis. A resident was defined as burned out if they scored high on the Maslach Burnout Inventory (MBI) emotional exhaustion or depersonalization scales. Personal accomplishment on the MBI was unreliable because most residents reported feelings of accomplishment despite overall burnout.

Results: Average rate of burnout amongst pediatric residents nationwide was 54% in 2016 (n=1410) and 54% in 2017 (n=1753). At OU-TU SCM, average rate of burnout was 47% in 2016 (n=17) and 63% in 2017 (n=16). Burnout in PGY1 class at OU-TU SCM in 2016 was 29% and then 50% when the class advanced to PGY2 level in 2017. Burnout in PGY2 class at OU-TU SCM in 2016 was 40% and then 33% when the class advanced to PGY3 level in 2017. However, only 3 of 6 residents in the 2017 PGY3 class participated in the study.

Discussion and Conclusion: Average rate of burnout nationally remained the same in 2016 and 2017, but there is an increasing average rate of burnout at OU-TU SCM. Burnout increased as the PGY1 class in 2016 advanced in level of training to PGY2 level in 2017. Although it may appear that burnout decreased as the PGY2 class in 2016 advanced in level of training to PGY3 level in 2017, no meaningful conclusion can be derived with only 3 residents responding to voluntary survey. Low response rate could be due to burnout, lack of time, or preparing for board examinations and graduation. In response to burnout rate in pediatric residents and study results, we implemented the following changes for the academic year of 2017-18: structural changes in inpatient coverage and scheduling, protected weekends off, and promoted wellness and mindfulness amongst OU-TU SCM residents.

THE PRESERVICE TEACHER'S JOURNEY TO KNOWLEDGE: ASSOCIATIONS WITH LEVELS OF EDUCATION

Abstract ID: 36

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Introduction: Historically, knowledge of child development has been one of the main emphases of early childhood teacher education programs, as it is theorized that teachers need strong content knowledge if they are to teach well. Knowledge of the age-related characteristics and behaviors of young children helps teachers understand children's capabilities in order to implement behavioral strategies and practices that will optimize learning and development . Teachers typically gain knowledge as they move through the degree ladder, from Child Development Associate (CDA) to Associates to Bachelor's . The purpose of this study was to examine 1) preservice teachers' knowledge of child development over time, more specifically across four areas of child development – cognitive, social, emotional, and physical; and 2) if currently working in childcare was associated with knowledge of child development.

Methods: The participants include students (n=60) from the community college, students (n=30) from the community college who had matriculated to the university, university students (n=6), and university graduates (n=2). The sample consisted of 98 students, 96 were female; 73% were white. Participants completed a demographic questionnaire and the Knowledge of Child Development Inventory, which consists of 56 multiple-choice items of knowledge relating to child development from birth to age 3.

Results: A repeated measures analysis of variance was conducted that examined the effect education level on knowledge of child development. There was a statistically significant main effect for education level on child development, $F_{(2,82)} = 5.94, p < .01$. There were also statistically significant differences on domain scores, e.g., cognitive development, $F_{(2, 82)}=4.74, p =.01$ and emotional development, $F_{(2, 83)}=4.96, p< .01$. Post hoc tests revealed participants with Bachelor's degree scored significantly higher than participants with a CDA or an Associates. These results indicate that as students move up the education ladder, they gain more knowledge of child development. This may suggest the Bachelor's program focuses on theoretical knowledge, whereas associates programs focus on practical knowledge.

Discussion: Results also demonstrated that students who were not currently working had the highest overall mean compared to those working in an early childhood field or an unrelated field. Initially, this finding took us by surprise. However, a common factor among the majority of these students was that they were not working to stay home with young children. In essence, they *were working* in an early childhood setting.

ENGINEERING & APPLIED RESEARCH

A GAME THEORETICAL APPROACH TO STUDY HUMAN BEHAVIOR IN CARPOOLING

Abstract ID: 66

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Background: Carpooling has gained some popularity recently especially in big cities. Many efforts have been conducted to improve the quality of carpooling to encourage for more participation. Carpooling involves several challenging problems like optimization routes and driven distances, scheduling of rides and fairness of ride. However, the human behavior aspect plays a vital role in carpooling sustainability, i.e., the lifetime of carpooling. In this work, we aim at modeling the relationship between human behavior and costs of participating in carpooling.

Method: Using game theory modeling, we derived long-term carpooling problem (LTCPP) as repeated games. To set up the game, we first built the payoff functions using according to the roles of carpooling users in the system: driver or client. Also, we included fairness criteria for using the carpooling such as the driven distances and the number and order of selecting drivers. Then, we derived the problem for the two-player game and showed that the game mimics the Prisoner's Dilemma problem. To find the Nash Equilibrium for the LCTPP, we extended the problem into a repeated game form for the two-player game. The derived Nash Equilibrium solution relates the payoffs of using the carpooling and the discounted average, and thus how payoffs influence the participation in carpooling. For N-user carpooling, we generalized our problem to have realistic application for real-life cases. The final derivation includes the number cycles of using the carpooling, payoffs and the order of selecting drivers in the system.

Results and Conclusion: Our derivation reveals that different factors that might affect the expected payoffs from participating in the carpool. First, the order of selecting driver role within the carpool cycle can be mathematically shown to affect how user values their participation in the carpool, where a lower fairness rate yielded lower overall-payoffs. Moreover, the number of users in carpool resulted in lower overall-payoff, i.e., the larger the number of carpool users the shorter the expected lifetime of the carpool. In conclusion, our derivation can be used to encourage the participation in carpooling systems by understanding how payoffs and other conditions can affect the lifetime of carpooling.

HAND-OVER FOR LESS: HOW TO REDUCE SIGNALLING LOAD IN FUTURE ULTRA-DENSE NETWORKS

Abstract ID: 71

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In order to overcome capacity crunch problem for today's networks, multiband and multi-tier network densification is seen as the most promising solution. As a result, small cells are being deployed within the macro cell (MC) coverage, to offload some of the users associated with MCs. Such massive deployment raises problems in terms of increased signalling overhead and strain on mobility management. With ultra-dense small cell deployment, mobility management will become complex because handovers (HO) are bound to increase even for low mobility. Frequent handovers in ultra-dense small cell deployments lead to a dramatic increase in signalling overhead. This suggests a paradigm shift towards a signalling conscious cellular architecture with smart mobility management. In this regard, Control Data Separation Architecture (CDSA) has been proposed in research community. This aims to overcome limitations of the conventional architecture by providing high data rate to users via small cells while the control signalling is maintained by macro cells. The users are setup in a dual connection mode.

In this work, we compare the reduction in handover signalling load achieved for CDSA versus conventional network deployments. Special Analytical models have been derived and presented for signalling probability and mobility signalling which compare the signalling generated during various handover scenarios in CDSA and conventionally deployed networks. Results presented show that CDSA performs better than conventional network and should be the future choice for 5th generation network deployment.

HOW TO PROVIDE ON-DEMAND CELLULAR COVERAGE THROUGH UNMANNED AERIAL VEHICLES?

Abstract ID: 43

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The demand for more diverse, flexible, accessible and resilient broad band service with higher capacity and coverage is on the rise. Some of these requirements of next generation cellular systems can be accomplished with the assistance of Unmanned Aerial Vehicles (UAVs) acting as flying base stations. This is because of the several advantages UAV based communication offers such as higher likelihood of line-of-sight path, less scatter and signal absorption without the need for ground sites as compared to terrestrial systems. As compared to satellite networks, a UAV-based solution offers lower latency, lower propagation loss and lower deployment costs with much more flexibility to move from one point to another, which is a desirable feature for rapid, on-demand or emergency communications. UAVs can thus be seen as potential enablers to meet the several challenges of next generation systems by either functioning as complementary architecture with already existing cellular networks to compensate for cell overload during peak times and emergency situations; or by serving as stand-alone architecture to provide new infrastructure, especially in remote areas. UAV based cellular coverage analysis is a topic of several recent studies. However, most of these studies derive coverage radius or probabilities while omitting or over-simplifying an important piece of UAV deployment puzzle, that our analysis shows, makes a trend shifting difference i.e., realistic antenna pattern. This work, for the first time addresses the UAV deployment design space while using a 3GPP defined realistic 3D directional antenna model, whose gain is not only dependent on the beamwidth, but also on the user's angle from boresite i.e., three-dimensional elevation angle. We formulate a non-linear multi-variable optimization problem for a UAV in order to determine maximum coverage radius as a function of antenna beamwidth and UAV altitude. Contrary to prior studies on UAV deployment, our proposed mathematical model shows that coverage radius does not increase monotonically with UAV altitude when practical antenna pattern is used. It also highlights the need of beamwidth optimization in addition to or instead of height optimization to control coverage and optimizing both antenna beamwidth as well as altitude of the UAV in tandem with each other rather than independently.

ULTRA-LOW POWER IOT TRAFFIC MONITORING SYSTEM

Abstract ID: 37

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Background: The Internet of Things (IoT) is shaping the new world we live in. Before we know it, our world will completely be different but smart. According to IHS forecasts, the number of connected devices will grow from 15.4 billion in 2015 to 30.7 billion in 2020. Forrester Research predicts that fleet management and the transportation sectors will be potentially among the winners for IoT growth. This may come at no surprise, since the infrastructure (roadways, bridges, airports, etc.) is a prime candidate for sensor integration to provide real-time measurements to support intelligent decisions. This research describes the development of a wireless sensor for vehicle detection.

Methodology: In this work, we present a novel system that enables real-time traffic monitoring and speed estimation using the virtues of the Internet of Things. The intelligent Vehicle Counter and Classifier Sensor (*i*VCCS) is designed by the WECAD group at OU-Tulsa. The second generation of the sensor is an evolution of a prototype that was a mere proof-of-concept. *i*VCCS 2^{nd}G is carefully designed to adhere to the IoT paradigm, providing enhanced processing platform and connectivity, yet consuming the least amount of power in order to prolong the battery life as much as possible. The system exploits the physical phenomenon where the magnetic field of the earth's surface in a local area is affected by ferrous materials found in vehicles' chassis. One sensor deployed on a road section counts the number of vehicles passed by; sensing the front and the back of a vehicle and logging time of arrival and departure for each vehicle. Two sensors can be deployed and speed is a straightforward result that can be obtained.

Results: The system was tested in two scenarios, a test in the lab using a train running continuously for 24 hours. Another on-campus field test where two sensors were deployed at the south entrance for 24 hours. Counting and estimating speed for individual cars were captured from the sensor. The system achieved 99% detection and counting accuracy. Reported speed harmonizes with the expectations and nominal values of real-world setting. Our conservative power analysis indicated a lifetime of about 18 days on a 2000 mAh battery, while empirical study revealed a lifetime of more than 200 days.

SOCIAL/BEHAVIORAL & COMMUNITY SERVICE

ADVERSE CHILDHOOD EXPERIENCES, A PREDICTOR OF LOWER TRUST IN THE MEDICAL PROFESSION

Abstract ID: 76

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Background: While, adverse childhood experiences (ACEs) have been linked to poorer health outcomes, the mechanisms which link ACEs and poor health have not been completely explored. Attachment theory suggests the link between ACEs and poorer health may be the result of adult perpetrated childhood trauma and its impact on an individual's ability to form close relationships with others. As theory suggests, those who have experienced trauma by a caregiver in childhood can "transfer" their feelings of distrust of caregivers onto others into adulthood. Ultimately if this transference occurs, this may partially explain the link between ACEs and poor health, as lower trust in the medical profession has been linked to care avoidance and poorer overall health.

Methods: The sample consisted of 95 participants receiving services from an agency serving young adults identifying as homeless. The mean age was 20 years with a gender distribution of 65% male and 35% female. The ethnic make-up of the sample was 50% white and 50% minority. The participants took an English only paper and pencil survey containing the adverse childhood experiences (ACE) scale, trust in the medical profession scale, and the adult attachment scale. Hierarchical linear regression was used to determine if ACEs predicted variance in trust in medical professionals over participants' attachment styles and demographics. Prior to interpreting the results of the regression model, the assumptions of regression analysis were tested and met.

Results: In step 1, higher comfort with depending on others had a positive relationship with trust in the medical profession, while greater anxiety toward others had a negative relationship with trust in the medical profession. The overall model accounted for 24% of variance in trust in the medical profession scores. In step two, all ACE groups were statistically significant predictors of lower trust in the medical profession over the covariates. Specifically, ACEs accounted for an additional 14% of variation in trust in the medical profession scores over the covariates.

Conclusion: The results indicate that the experience of one or more ACEs predicts lower trust in the medical profession. Such results support attachment theory by demonstrating the experience of ACEs affects one's perceptions of caregivers, including perceptions of medical professionals. Lower trust in the medical profession may also be an important link between ACEs and poorer health, as research indicates lower trust in the medical profession is associated with less compliance with physicians' treatment recommendations and less willingness to seek care.

ASSESSING POLYVICTIMIZATION FOR DOMESTIC VIOLENCE SURVIVORS: A SYSTEMATIC REVIEW OF SCREENING TOOLS

Abstract ID: 52

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1. University of Oklahoma - Tulsa, 2. Alliance for Hope International

Background: There is an estimated 10 million victims of intimate partner violence (IPV) in the US annually. These survivors often experience difficulties in physical health, mental health, and social isolation. Victims also suffer when they have to repeatedly tell their story in order to get legal and social service support. Family Justice Centers (multi-agency, multidisciplinary centers) provide survivors a one-stop shop where they tell their story only once. The Department of Justice – Office for Victims of Crime recognized that survivors are likely victims of additional adverse events and awarded a grant to develop and implement a Polyvictimization screening tool in the 137+ Family Justice Centers (FJCs) across the US. The purpose of this study is to present findings on the systematic review of trauma informed screening tools for Polyvictimization as part of this federal grant.

Methods: A systematic review (Page, 2008) was conducted using an exhaustive list of terms related to polyvictimization, types of trauma, screening, and tools. Databases and search engines were utilized in the attempt to include the *grey literature* (Page, 2008). The review produced 121 possible tools. The systematic review evaluated the quality of screening instruments using 6 criteria (number of items, time requirement, age appropriateness, redundancy, congruence with polyvictimization framework, and ability to obtain the tool).

Results: A total of 30 tools met the inclusion criteria. These tools were presented to the 6 FJC partner sites (located in California, Oklahoma, Wisconsin, New York, and Louisiana). The presentation classified the tools into 3 categories: symptoms (12 tools), events (12 tools), and mix (6 tools); listed the pros/ cons of each tool and provided the citation and link to each tool. Based upon feedback from the six sites, a final screening tool was developed for pilot testing.

Conclusion: The U.S. Department of Justice, Office for Victims of Crime, funded the National Family Justice Center Polyvictimization Initiative entitled "Pathways to Hope, Healing, and Justice." The Initiative is focused on creating trauma-informed, Hope-centered approaches to meeting the needs of survivors of multiple forms of trauma seeking services in Family Justice Centers. This systematic review identified 30 tools that met the quality criteria and informed the final tool that is being pilot tested in six FJCs across the US. The final result will be a single polyvictim screening tool that will be implemented in the 137+ FJCs across the US.

ASSOCIATION BETWEEN GRIT AND BURNOUT IN OUSCM CLINICAL AND NON-CLINICAL TRAINEES

Abstract ID: 48

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1. OUSCM

Background: Burnout is highly prevalent among residents and medical students, and has been shown to negatively impact patient care. Grit, the ability to maintain passion and persevere, has been associated with decreased levels of burnout. This study aimed to determine if clinical and non-clinical trainees at the University of Oklahoma, OU-TU School of Community Medicine (OUSCM) suffer from high levels of burnout, as national trends suggest. Additionally, we investigated the association between grit and burnout.

Methods: An IRB approved cross-sectional study was utilized to measure burnout and grit using the Maslach Burnout Inventory (MBI) and Grit-S, respectively. Participants received access to the surveys by university email during March and April of 2017. Each participant received specific surveys based on their status as clinical or non-clinical trainees. Clinical trainees received the abbreviated MBI consisting of emotional exhaustion, depersonalization, and personal accomplishment, whereas non-clinical trainees received the university MBI consisting of exhaustion, cynicism, and professional efficacy. Both groups received the Grit-S survey. Surveys included demographic questions of age, race, gender, program, and year. All data were analyzed in SPSS version 20.0.

Results: We received 113 surveys from clinical trainees (40% response rate) and 55 from non-clinical trainees (62% response rate). There was no significant differences in MBI and grit by program year. There were several significant associations between grit and burnout for clinical and non-clinical trainees. Among clinical trainees, personal accomplishment increased as grit increased (r=.245, p=.018), while grit was inversely associated with emotional exhaustion and depersonalization (r=-.340, p=.001; r=-.258, p=.012). Among non-clinical trainees, grit was positively associated with professional efficacy (r=.381, p=.007), while cynicism decreased as grit increased (r=-.437, p=.002).

Conclusion: Although burnout prevalence has been well-studied, further research is needed to determine contributing factors, especially among residents, medical students, and physician assistant students. As previous national research and this study suggest, grit is an important factor in burnout levels in clinical and non-clinical trainees and may be a protective factor against burnout. Grit is important in order to maintain the high level of commitment required to reach their goal of becoming a physician. Fostering and maintaining grit among trainees is especially important for developing compassionate and caring future physicians.

EXAMINING THE RELATIONSHIP BETWEEN CASA ADVOCATES ON CHILDREN'S HOPE

Abstract ID: 68

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Objective: The CDC stated there were 683,000 victims of child abuse and neglect reported to child protective services in the United States in 2015, accounting for a financial toll of $124 billion dollars per year. Relatedly, there are an estimated 427,910 children living in foster care in the United States, according to a point-in-time study in 2015. Court Appointed Special Advocates (CASAs) are trained volunteers sworn in by a judge, investigating context of the child(ren)'s circumstances and providing fact-based information and recommendations representing children's best interests in active juvenile court cases. A CASA advocate simultaneously works as a support source for the child(ren). The purpose of this study is to investigate and present the impact of CASA volunteers' support as it relates to children's perceived hope.

Methods: As part of a program evaluation effort, children from all 23 CASA locations in Oklahoma were offered the opportunity to complete an anonymous survey through their CASA volunteer. There were ultimately 241 CASA children participating in the survey. In conjunction with an annual survey focused on interactions with CASA volunteers, children were also asked to complete the six-item hope scale.

Results: Pearson product moment correlation analyses showed a positive relationship between interactions with the CASA advocate and hope. Multiple regression was calculated in order to test distinct perceptions of CASA in relation to communication with the attorney, judge, and DHS worker in the prediction of children's hope. These findings show that interactions with CASA advocates is related to abused children's level hope as they navigate the Oklahoma court system.

Conclusion: The CASA program was first implemented in Seattle, Washington, in 1977 to provide children who had been victims of child abuse and neglect with a trained advocate to voice their own best interests in court proceedings. Since its inception, the United States has seen over two million children in the foster care system served by the CASA organization. This state-wide survey has analyzed and exhibited a positive relational significance in CASA children's perspectives of the CASA-child relationship and the impact these perspectives have on individual children's hope. Hope has proven to function as a protective factor when one is facing stressful life experiences.

FROM WISH TO HOPE: PARENTING PROGRAM AS PATHWAY TO REACH SECURE ATTACHMENT

Abstract ID: 53

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1. University of Oklahoma - Tulsa

Background: This qualitative study aims to investigate the nature of parenting goals and pathways as described by parents at-risk for child maltreatment. Having secure attachment and providing a nurturing environment are the goals of many parents. However, at-risk parents often lack pathways to reach these goals. "Circle of Security" is a parenting program aiming to enhance attachment security between parents and children through early intervention. The focus of the intervention moves from discussing secure attachment and children's needs, to a process of parent reflections concerning behaviors that maintain insecure and disorganized attachment. An intervention as such could have an impact on the parenting goals, pathways and hope.

Method: 86 parents were monitored in the "Circle of Security" program at the parent- child center of Tulsa Oklahoma. Parents goals, pathways and hope were examined in a pre-test post-test design. The first assessment took place at the beginning of the intervention, and the last assessment was at the end of the intervention. The parents were asked to detail their goals to the relationship with their children, their pathways to reach these goals, and their hope. Data analysis was done in accordance with a qualitative approach based on the Grounded Theory, whereby the encoding is a crucial link between data collection and developing an emergent theory that explains the data.

Results: Qualitative analyses of the parent's goals, pathways and hope before and after the intervention reveals most of the parents came to the program with significant limitations in their pathways to reach their goals of having a better relationship and secure attachment with their children. The parenting program gave them the pathways to reach their goals. It provided them knowledge and skills about how to create secure attachment and a nurturing environment for their children. In addition, getting the pathways to reach their goals increased the parents' hope. Receiving pathways also resulted in the creation of more goals in the parent-child relationship, including an increase of long-term and self-oriented goals.

Conclusion: The Circle of Security program is a way of providing at-risk parents pathways to attain secure attachments with their children and promote parental hope. This could be an important step to strengthening families, enhancing secure attachment, promoting nurturing environments, and reducing the risk of maltreatment. Goals without pathways is described as a wish. Based upon the nature of narratives provided by at-risk parents, this program helped parents transition from wish to hope.

FUTURE PHYSICIANS PUTTING HEALTH INTO PRACTICE: HEALTHY LIFESTYLES, HEALTHY COMMUNITIES

Abstract ID: 79

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1. *OUSCM,* **2.** *University of Oklahoma Health Sciences Center, OU-Tulsa*

Introduction: Physicians making healthy lifestyle choices are more likely to provide persuasive and credible counseling on health behaviors. Yet, most U.S. medical schools lack structured lifestyle medicine curricula to build confidence in lifestyle medicine counseling or provide wellness programs to improve student health. The Healthy Lifestyles, Healthy Communities study aims to assess the health behaviors and curriculum needs related to lifestyle behaviors of University of Oklahoma School of Community Medicine (OUSCM) students.

Methods: OUSCM medical students were invited by email to participate in an online survey available December 15, 2017 through January 24, 2018 and received $10 compensation after survey completion. The survey included self-reported height, weight and recent weight change, as well as validated, standardized items to assess fruit and vegetable intake, Mediterranean diet adherence (scale: 0-14 low-high adherence), physical activity, tobacco use, and alcohol use. We used the '5As Framework' from tobacco counseling to assess knowledge and confidence in lifestyle counseling on nutrition, exercise, weight, tobacco, and alcohol. All calculations were done using SPSS, version 24.

Results: The overall survey response rate was 56.9% and included 64.7% of preclinical students and 40% of clinical students. While only one-third of respondents were overweight (25.8%) or obese (8.1%), 26.6% reported weight gain since beginning medical school. Reported average daily servings of vegetables (M=2.6, SD=1.7) and fruit (M=1.8, SD=1.1) were below dietary recommendations. Mean adherence to the Mediterranean Diet was 6.02 (SD=2.4; range: 0-12 points). 32.8% of students were inactive according to weekly physical activity guidelines. The majority responded medical practice counseling was very important or essential for nutrition (94.8%) and physical activity (84.3%). However, few felt they have sufficient knowledge or confidence to advise a patient on nutrition (35.1% and 26.8%, respectively) and physical activity (39.1% and 25.1%, respectively). Similar disparities in knowledge and counseling confidence were observed for the other lifestyle factors assessed.

Conclusion: Few OUSCM medical students are meeting diet and physical activity-related behavior guidelines. Wellness programs to promote healthy eating and physical activity may support student achievement of these goals. Additionally, gaps exist between students' perceived importance of lifestyle behaviors in practice and personal knowledge and confidence of lifestyle behavior counseling. Students need avenues to increase knowledge of and confidence in effective counseling practices for all lifestyle factors to bridge these gaps.

HOPE AND SECONDARY TRAUMA IN PHYSICIANS EXPOSED TO CHILD MALTREATMENT

Abstract ID: 87

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Objective: Hope is the theory that one will have the mental strategy and mental energy to obtain goals. Higher hope has been shown to protect individuals from a variety of negative outcomes. Secondary Traumatic Stress (STS) occurs in individuals with direct contact to victims, and manifests as intrusive thoughts, avoidance, and extreme arousal. Physicians in fields that deal with child maltreatment may experience STS. The purpose of this study is to evaluate the prevalence of hope and its relation to STS in physicians training in these careers.

Methods: Surveys were distributed electronically to fellowship directors and fellowship coordinators of all ACGME accredited programs in child abuse pediatrics, child and adolescent psychiatry, and forensic pathology between March and September 2017 with the request to distribute the surveys to their current and recent fellows over the last 5 years. These surveys included the Adult Trait Hope Scale and STS Scale, plus the Oldenburg Burnout Inventory, Adverse Childhood Experiences, demographics, and fellowship-specific questions concerning STS prevention. While hope can be evaluated both as an overall scale and as subscales, STS is analyzed using its distinct subscales. Data was analyzed using one-way ANOVA and correlations.

Results: A total of 61 surveys were completed. 73.8% endorsed at least one avoidance symptom, 70.5% at least one intrusion symptom, and 72.1% at least one arousal symptom. On average, each person had 2.48+2.248 avoidance symptoms, 1.52+1.312 intrusion symptoms, and 2.20+1.740 arousal symptoms. Three avoidance symptoms, one intrusion symptom, and two arousal symptoms are considered diagnostic for PTSD. Child and adolescent psychiatry had the highest percentage of "high hope" (23.5%) compared to child abuse pediatrics (12.5%) and forensic pathology (10%) but there was no statistically significant difference between the subspecialties (F=.333, p=.718). Hope and the three subscales of STS showed significant, negative associations (Intrusion: r = -.503, p < .0001; Avoidance: r = -.511, p < .0001; Arousal: r = -.405, p = .001).

Conclusions: STS impacts the hope of trainees. Ongoing exposure to child maltreatment raises the risk for STS which can erode hope. Because higher hope yields improved health, health-related practices, and coping, fellowship programs in child abuse pediatrics, child and adolescent psychiatry, and forensic pathology should have programs in place to identify STS and interventions to combat it.

HOPE AS A PROTECTIVE FACTOR IN MEDICAL STUDENT BURNOUT

Abstract ID: 49

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Background: A major problem facing today's physicians and medical students is burnout, a phenomenon characterized by exhaustion, depersonalization, and diminished professional efficacy. Burnout has been described in many studies as a product of chronic stress, often resulting from a lack of protective psychological factors. Hope, one such protective factor, is defined as one's ability to identify pathways and to motivate oneself to achieve desired goals. Previous studies support a negative association between burnout and hope in different populations. The purpose of this study was to explore the relationship between hope and burnout in order to guide efforts toward combatting burnout in medical training.

Methods: Data were collected using an anonymous and voluntary Qualtrics survey administered to all OU medical students. The survey included the Adult Dispositional Hope Scale (range = 8-64), Perceived Stress Scale (range = 10-50), and Oldenburg Burnout Inventory (range = 16-64). Altogether, 236 respondents completed the survey out of 652 eligible participants (response rate = 36.2%). All data were analyzed using Statistical Package for Social Sciences (SPSS) software.

Results: The average scale scores of the student responses (n=236) were as follows: hope (52.8 ± 6.7), stress (26.2 ± 7.2), and burnout (43.0 ± 10.0). Pearson correlation analysis demonstrated a significant positive relationship (r = .64; $p < .01$) between stress and burnout and a significant negative relationship (r = -.48; $p < .01$) between hope and burnout. Hierarchical regression showed that hope accounted for significant variance in burnout over and above psychological stress [ΔR^2 = .02; $F (1, 231)$ = 8.54; $p < .01$]. In addition, the analysis revealed a significant negative relationship between hope and medical student burnout. In the final model, hope and stress accounted for approximately 43% of the variance in medical student burnout [$F (2, 231)$ = 87.64; $p < .001$].

Conclusion: Higher levels of hope have a statistically significant association with lower levels of burnout among medical students outside of the influence of stress. Our findings suggest that medical school administrations might be able to leverage hope to approach the issue of burnout in medical education in a more focused, less resource-intensive fashion. The growing body of research supports hope as a potential protective factor in burnout and as a cognitive process that can be learned and sustained through targeted interventions. Our study supports the idea of using hope-based interventions in medical student populations.

IMPROVING NO SHOW RATES IN AN ACADEMIC INTERNAL MEDICINE CLINIC

Abstract ID: 56

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Background: No-show rates are historically known to be higher in the academic ambulatory setting, likely due to multiple barriers affecting lower income patients. It's been shown that frequent no-shows can affect clinic productivity and clinical outcomes. We designed and implemented a quality improvement project aimed at reducing the no-show rate in the Internal Medicine practice from 22% to 15% by May 2017.

Methods: The internal medicine practice defines no-show appointments as scheduled appointments that are not attended or canceled 24 hours prior to the designated time. Using IHI tools including a root cause analysis and process map and identified four areas in which to improve: 1) appointment reminder system, 2) patient contact information update, 3) patient involvement in appointment scheduling, and 4) no-show policy adherence. When examining the existing no-show policy, it became clear a new policy was needed. Working with clinic administration, we implemented a new no-show policy that involved assigning habitual no-show patients as "walk-in only" in the EHR. These patients were no longer scheduled appointments but instead were asked to walk in to the clinic as needed; faculty providers fit walk-in patients into their schedules as they are able.

Results: We were able to improve the no-show rate from 22% to 19% by the end of May 2017 and continued the project through August and saw further improvement to 14%. Due to administrative complications, it proved difficult to assign start and stop dates to our interventions. However, we attribute the majority of the improvement to working with clinic administration on implementing and adhering to the new no-show policy.

Conclusions: High no-show rates in outpatient clinics are a cause of significant concern for healthcare providers. Multiple interventions tailored to individual clinic needs are key to reducing the rate of patient no-shows. In the case of our project, targeting the habitual no-show patients with a new no-show policy proved to be the more successful intervention. Our clinic continues to perform regular audits of this outcome and likely new strategies for improvement will be initiated in the future.

INTEREST-FREE AND INCENTIVE-BASED MICRO-LENDING FOR INTERNATIONAL GRADUATE STUDENTS

Abstract ID: 72

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1. *University of Oklahoma - Tulsa*

Focusing on your important goals such as completing education or responding to a life-changing opportunity sometimes requires having enough monetary resources to take action. Many local and international graduate students face educational and job expenses not anticipated, which may block their aspirations from coming into fruition without money from a lending source. However, conventional lending sources such banks and non-profits not only penalize the borrower with high interest rates, but also punish the borrower in the incident of missing a loan payment.

At Lets Sow Together (LeST), a 501 c (3) approved non-profit organization, we have sought to defy traditional lending and the burden of interest rates. We have changed the paradigm of micro-finance and interest-free lending. Not only do we not charge any interest on loans, instead the borrower is benefited with the incentive of repaying a smaller amount than what they started with as loan depending on the rate at which they pay it down.

Our real-life case studies and results show behavioral change and better accountability in addition to borrowers becoming empathetic towards the whole idea of this type of micro-finance lending.

Real life results indicate that out of 14 people total who were approved to benefit, this style of lending has resulted in more than an 88% rate of loan payback, and approximately 57% of borrowers volunteered with the organization after paying back their loans because they saw the validity of the mission of Lets Sow Together through their own personal experiences. This data suggests further participation in this microloan model would encourage results similarly among those who benefit.

OU FOOD PHARMACY: ADDRESSING FOOD INSECURITY AND DISEASE SELF-MANAGEMENT IN UNINSURED PATIENTS.

Abstract ID: 78

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Background: Food insecurity is the state of being without a stable food supply for an active, healthy life and has been associated with chronic disease and related poor outcomes such as diabetes, hypertension, depression, poor medication adherence, and increased emergency room use. Certain populations, such as persons without employment or medical insurance, experience higher rates of food insecurity. The OU Food Pharmacy study was developed to assess the prevalence of food insecurity within uninsured populations accessing select OU clinics and to evaluate the benefits of food assistance on disease self-management behaviors and outcomes.

Methods: The Food Pharmacy was implemented between 2016 and 2017 at two OU Clinics serving uninsured populations in collaboration with the Community Food Bank of Eastern Oklahoma. Participants were identified by clinic personnel or given the option to self-enroll in a longitudinal study. The intervention consisted of a food box comprised of shelf-stable medically-tailored foods, fresh produce, five recipe cards, and a nutrition education booklet upon enrollment. Participants were then given access to a food box, new recipe cards, and fresh produce up to six additional times. We collected baseline measures including dietary intake of fiber, fruits, and vegetables, food security, and health markers such as blood pressure, lipids and body mass index (BMI). Repeat measures were collected at each subsequent Food Pharmacy visit through self-administered surveys and medical chart reviews. Outcomes were measured using paired sample t-tests for participants who accessed the Food Pharmacy at least four times (n=43). This study was approved by the OUHSC IRB.

Results: Eighty participants (27 males, 53 females) were enrolled in the study. At baseline, the majority of participants were food insecure (87%), reported poor or fair self-rated health (69.6%), and had a diabetes diagnosis (63.3%). Upon the fourth visit, Participants experienced significant improvement in daily fiber intake (M=14.0 to 17.1, t=-4.110, p<.0001) and a non-significant increase in daily fruit and vegetable intake (M=3.4 cups to 3.6 cups, t=-1.597, p=0.118). Among participants who had high blood pressure at enrollment (n=17), diastolic blood pressure significantly improved (M=90.9 to 83.9, t=2.950, p=.009). However, food security did not significantly change.

Conclusion: Results show a medically-tailored food pantry program may support changes in nutrition-related behaviors and improve blood pressure. Randomized control trials are needed to confirm these relationships.

PROJECT REVIVE: USING GIS MAPPING TO IDENTIFY HEALTH TRENDS IN PEDIATRIC POPULATION

Abstract ID: 26

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Background: Visualizing and analyzing the relationship between health-harming housing and incidence of asthma and bronchiolitis in pediatric patients using GIS mapping.

Objectives: Evaluate whether poor housing is a strong predictor of variance of asthma and bronchiolitis cases in pediatric patients visiting Schusterman Clinic by census tract in Tulsa, Oklahoma using ArcGis Pro Software and multiple regression statistical models.

Methods: Housing properties determined to be health-harming and violating housing code by the Tulsa City-County Health Department were recorded and mapped from 2013 as addresses with zip codes. The addresses of pediatric patients with records of at least one clinical diagnosis of asthma or bronchiolitis at Schusterman Clinic in 2013 were mapped overlaying the housing data. Each address mapped through ArcGis Pro Software had a corresponding geocode, also referred to as GEOID, which matched at a confidence level of 85. The resulting geocodes of poor housing, asthma, and bronchiolitis incidences were grouped by census tract to reveal hotspots and exported for statistical analyses.

Results: Multiple regression analyses were performed in order to examine the strength of environmental variables as predictors, primarily poor housing, in accounting for variance in asthma and bronchiolitis rates as outcome variables. The unit of analysis was census tracts in the Tulsa area (N = 222). The first multiple regression model indicated that a significant proportion of the variance in asthma cases was predicted by environmental variables $(F_{(18, 203)} = 17.79, p < .001)$. In particular, housing code violations $(\beta = .360; p < .001)$ showed a significant positive relationship with asthma diagnosis. The second multiple regression model indicated that a significant proportion of the variance in bronchiolitis cases was predicted by environmental variables $(F_{(18, 203)} = 3.92, p < .001)$. Housing code violations $(\beta = .294; p = .01)$ showed a significant positive relationship with bronchiolitis diagnosis.

Conclusion: Health-harming housing is a strong predictor of variance in asthma and bronchiolitis cases in pediatric patients living in Tulsa, OK. GIS mapping identified hotspots of high-risk housing to allow for planning interventions to prevent incidences of these diagnoses in children residing in these areas.

QUALITY IMPROVEMENT THEMES IN PRACTICE FACILITATION TO IMPROVE CARDIOVASCULAR CARE

Abstract ID: 64

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1. *OU-TU School of Community Medicine*

Background: The Healthy Hearts for Oklahoma (H2O) Project aims to establish a primary health care improvement extension system to support quality improvement in small to medium size primary care practices. H2O focuses on prevention of cardiovascular events through the management of ABCS—aspirin use, blood pressure, cholesterol, and smoking. Support includes performance feedback, academic detailing, practice facilitation, and information technology support. A Practice Enhancement Assistant (PEA) and Academic Detailer conducted a visit with participating clinicians to provide ABCS guideline education. The PEA made bi-weekly visits over 12 months to facilitate practice implementation and process improvement. PEAs recorded practice goals, target performance rates, interventions conducted in the practice, enhancements made to the electronic health record (EHR), and the distribution of resources in an Electronic Practice Record (EPR). A free-text field captured the PEA's subjective impression of the improvements made by the practice and barriers experienced in facilitation.

Methods: One intervention close out narrative was selected for each PEA and read by a student researcher and the principal investigator. Both individuals identified high level themes describing the practice environment at the time of intervention close out. Iterative review of the separately generated list of themes was conducted until the researchers agreed on themes.

Results: Preliminary themes include clinician engagement, staff engagement, process improvement, scheduling barriers, and EHR/IT barriers. Examples from the intervention close out narratives are as follows:

Clinician engagement: "Clinician blocked out lunch break time over several weeks to be trained on how to properly document these measures."

Staff engagement: "The nurses have been very proactive in learning the new processes as well as the clinician. They will have the capacity to maintain their numbers for reporting, once the project has ended."

Process improvement: "The nurses also started taking multiple BP readings if the readings were high when the PT came in and before the PT left the clinic. They also allowed the PT to sit longer before taking the initial BP reading while updating medications etc."

Scheduling issues: "Finding a time to meet was sometimes difficult. They changed EHRs and this caused a 6 month delay on visits to the clinic."

EHR/IT issues: "The inability to collect data was a disappointment. The EHR is not connected to MyHealth."

Conclusion: Results will help inform future EPR database design, will be used to train PEAs on thorough EPR documentation, and will provide supplemental information for the formal evaluation of the H2O Project.

THE HEAL PROGRAM: HEALTH EDUCATION TOWARDS ACADEMIC LEADERSHIP

Abstract ID: 41

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Background: Many students of low socioeconomic status (SES) choose to delay admission to, or even reject, attending college. A variety of factors accumulate to this decision, including household income and parental education, alluding to the fact that the social habitus of low SES students can potentially decrease a student's perceived attainability for lifetime success. However, involvement in high school leadership has been scientifically proven to increase postsecondary success in students, including 4-year college attendance and graduation. The HEAL (Health Education towards Academic Leadership) Program focuses on the increasing self-efficacy of students.

HEAL is a program that draws on team-building exercises, community health exploration, and face-to-face interviews with local community leaders to train participants to be peer mentors to middle school students on various health topics. By empowering students to select health topics they find pertinent, HEAL helps students visualize themselves in the health care field and in positions of leadership.

We hypothesize that HEAL program will promote student self-efficacy and promote attitude modifications that eventually will lead to increased post-secondary involvement.

Methods: In the 2018 academic year, 20 high school students were recruited from the Carrera Adolescent Pregnancy Prevention Program, located at Union Public Schools. With IRB approval, data on the students' attitudes towards self-efficacy and leadership were collected through a pre-test and then post- test survey. Results from the survey were analyzed using descriptive analysis and via the Statistical Package for the Social Sciences.

Results: A significant difference was found in the students' attitudes in regards to perceived ability to achieve the goals they set for themselves (p=0.1).Over 47% have indicated that they are now newly interested in various health care fields and plan to pursue this post graduation. Further, pre-survey results noted that 50% of students do not feel responsible for their community while post survey results noted that there was a significant change in this perception. After the program, 85% felt that they were responsible for their community. As well, 100% of students appreciated the opportunity to work as a team and learn to teach others about health topics. 100% of students also enjoyed interacting with leaders in the community to learn about post-graduation job potential.

Conclusion: The HEAL program provides an opportunity for low SES youth to increase their self-efficacy and explore the potential for them to have promising healthcare related careers.

THE SIX C'S: COPING METHODS AT THE OU-TU SCHOOL OF COMMUNITY MEDICINE

Abstract ID: 95

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PURPOSE: Although research has established the high rate of health worker burnout, knowledge of coping strategies and evidence-based interventions is lacking. The purpose of this study was to understand and explore current coping methods used to reduce stress and feelings of depression by groups affiliated with the OU-TU School of Community Medicine (SCM).

METHODS: We received 575 completed surveys. The exploratory qualitative question "Please list any coping methods you use that were not addressed in the question above" was asked in order to identify and explore additional coping methods that were not selected from a list of common coping methods in a previous question. This resulted in 122 additional responses. Using MAXQDA Software, five researchers individually coded responses based on similar ideas, interpretation of the author and prior experience. All five researchers' codes were merged into a single document for analysis and discussion. Two code meetings were required for researchers to reach consensus of each code. A codebook was developed and overall themes were identified by sorting recurrent methods based on what common purpose they achieved.

RESULTS: A number of major themes emerged-our six C's of coping: 1) "Climate Control" where participants increase their autonomy over their surroundings and stimulation in order handle stress such as taking a break, using ear plugs, spending time outdoors or listening to music. 2) "Connection," where respondents find ways to connect to other "beings" for example, collegial support, spirituality and spending time with pets. 3) "Create," including hobbies and do-it-yourself projects. 4) "Clean" describes spending time tidying up themselves, their work or their environment. 5) "Consumption Behaviors" such as eating, shopping or drinking alcohol. 6) "Confront," where participants address their stressors directly.

CONCLUSIONS: The field of medicine is often stressful and demanding, and healthcare systems are increasingly focusing on ways to promote a healthy and productive workforce. Adding to the national conversation about burnout and wellness, the study findings suggest that trainees, staff, and faculty at the SCM utilize a variety of individual coping methods to address stress or feeling depressed through exercising autonomy, enjoying social connections, acting to create, addressing stressors directly, consuming, and actively managing how self and environment are organized. Further research might investigate which coping methods are most effective for which kinds of stress and how institutions might implement system-wide wellness initiatives that will complement individual coping.

UNIVERSITY OF TULSA

ASPECTS OF DATA ANALYSIS TO EVALUATE BRAIN WAVE DATA FOR FURTHER RESEARCH USES

Abstract ID: 101

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1. University of Tulsa

We present our study of publicly available brainwave dataset and make some comparison with MUSE data output. Muse is a tool which gives accurate, real-time feedback on what's happening in user's brain when they meditate. For this research, we will use Temple University's publicly available EEG Corpus freely available brainwave data to see if comparing this dataset with MUSE data output is sufficient enough to carry on further human study research. This dataset consists of 12,000 patients' 16-channel EEG data and it is taken from Temple University hospital repository. We will use the MUSE on ourselves to understand how it works so that we can see how closely the data it produces matches the publicly available data. Muse is a portable and wireless 4-channel EEG headband and we will use various data analysis techniques such as predictive analytics to compare Muse data with the publicly available data to check if we can find any similar interesting patterns or not or correlation analysis to correlate various attributes and characteristics. The potential of this preliminary study is that if we can find some similar properties in both cases then we can extend our research on a broader scale which can involve further human studies toward developing an activity recommendation system. This can recommend users' various activities to improve his mental well-being such as improving focus, calming the mind, elevating mode based on the preliminary data analysis.

DISTORTIONS OF THE PAST: PARALLAX AND ITS INFLUENCE ON GEOMETRIC MORPHOMETRICS

Abstract ID: 114

Ms. Kyleigh Royal [1], Dr. Briggs Buchanan [1], Dr. Danielle Macdonald [1]

1. University of Tulsa

Variability in artifact morphology can illuminate differences in cultural practices, learning communities, and tool function. Geometric morphometric analysis is a suite of methods for capturing and statistically analyzing shape differences in artifacts. However, little research has been conducted on how parallax—the effect of the position of an object in relation to the viewer or camera—effects how the shape of an artifact is measured with geometric morphometrics. It is important to assess the impact that parallax has on the analysis of artifact shape because in many cases artifacts are digitized from published photographs where the camera angle is not known. If there are significant differences in measurements based on different camera angles, it could lead to incorrect classification and perception of an artifact. To test the effect of parallax on standard geometric morphometric analyses of artifacts, we photographed three assemblages of stone artifacts (microliths) at multiple angles to test the degree to which parallax affects the measurement of shape of small artifacts photographed at close range (~50cm). This poster presents preliminary results from these experiments, exploring how parallax changes our understanding of artifact variability and our interpretations of past material culture.

EFFECT OF THREAT OF VIOLENCE ON THE TIME TO REPORT SEXUAL ASSAULT

Abstract ID: 96

Ms. Ashley Bailey [1], Ms. Ashley Clausen [1], Ms. Rachel Micol [1], Dr. Joanne Davis [1], Ms. Jenny Lee [1]

1. *University of Tulsa*

Objective: An increased amount of time between a sexual assault and filing a police report is thought to negatively influence the perceived credibility of the rape survivor. However, little is known about factors that may influence the time to report a sexual assault. This exploratory analysis examined if threat of violence (towards the victim or the victim's family) significantly impacts the time a survivor takes to report an assault.

Method: Participants included 631 female rape survivors ages 18-82 (M=29.6, SD=10.7) who completed a Sexual Assault Nurse Examiner exam. Age, time to report the assault, and threat of violence were assessed via self-report within the exam. Age was explored as a possible covariate. Independent samples t-tests were used to investigate potential differences in time to report a sexual assault between those who did and those who did not experience a threat of violence.

RESULTS: Age was not related to time to report (r=0.07, p=0.064) and not included as a covariate. Results suggest that time to report was not different between females who did (M=20.6 hours, SD=27.6) and did not (M=23.1, SD=27.4) experience a threat of violence (t(629)=1.145, p=0.252).

DISCUSSION: This study examines the impact of a threat of violence on time to report a sexual assault. Results provide initial evidence that factors other than threat of violence (e.g., social support) may influence the time it takes a survivor to report, highlighting the need for future research in this area.

FLOATATION REST: A NON-PHARMACOLOGICAL APPROACH TO REDUCING PHYSIOLOGICAL AND PSYCHOLOGICAL STRESS IN ANOREXIA NERVOSA

Abstract ID: 99

Mr. Eric Breese [1], Dr. Sahib Khalsa [1]

1. University of Tulsa

Background: Floatation-REST (Reduced Environmental Stimulation Therapy) is a novel, body-based intervention for reducing physiological and psychological stress. No studies have examined the effects of Floatation-REST in individuals with anorexia nervosa (AN), a psychiatric disorder characterized by heightened anxiety, distorted body image, and disrupted interoception.

Methods: Participants completed a total of four floatation sessions. Following each float, participants completed self-report questionnaires and an open ended debriefing interview. Heart rate and heart rate variability (HRV) were recorded during each float, to evaluate the influence of floating on sympathetic and parasympathetic nervous system input to the heart.

Results: Twenty-one weight-restored outpatients with AN completed the study. Participants reported significant and large reductions in anxiety across each float session ($p < 0.001$, estimated Cohen's D > 1). They also reported heightened interoceptive awareness for cardiorespiratory ($p<0.01$, Cohen's d 0.2-0.5) but not gastrointestinal sensations, and reduced body dissatisfaction ratings on the Photographic Figure Rating Scale ($p<0.001$, Cohen's d>0.5) following floating. Qualitative analysis of post-float interviews indicates that 100% of participants described their final float experience as relaxing, and 76% were interested in floating again. The forthcoming HRV analysis will examine influence of floatation-REST on cardiovagal activity.

Conclusions: Floatation-REST was well tolerated by the AN participants in this study, and there was no evidence of orthostatic hypotension (primary outcome). Subjective feelings of reduced anxiety and increased relaxation were further reflected in the participants' descriptions of their experience. This initial trial suggests that Floatation-REST should be investigated for potential clinical benefit in more acutely ill patients.

IMPACT OF CLIMATOLOGIC FACTORS ON THE AIRBORNE LEAD IN NORTHEASTERN OKLAHOMA

Abstract ID: 109

Ms. Julie McDonald [1], Dr. Jimmy Li [1], Mr. Hayden Curtis [2]

1. University of Tulsa, 2. Jenks High School

Picher, Oklahoma is home to the Tar Creek Superfund site, which is part of the Tri-State mining district. The mines were in production from 1850 to 1950. One hundred years of production has left numerous chat piles on the surrounding environment directly affecting the town of Picher. One such byproduct of the mining includes lead (Pb) dust that have been transported around the town settling throughout and seeped into groundwater, lakes, ponds and rivers. Due to the contamination, many children in the area have elevated Pb levels in their bodies, which have led to learning disabilities and other problems. While numerous efforts have focused on the contamination of heavy metals in surface water and groundwater systems, no studies have investigated the addition of Pb via atmospheric dust and deposition to the aquatic environment. We collected data for atmospheric dust containing Pb from 2010 to 2016 in both Tulsa, Oklahoma and Picher, Oklahoma as well as precipitation data for these two locations. During our study of atmospheric dust for Pb, we found a temporal correlation between atmospheric concentration of Pb and precipitation. This was seen in annual patterns in both locations in graphs.

INVESTIGATION INTO THE INTRAGENOMIC VARIATION OF RDNA WITHIN THE SEXUALLY REPRODUCING GREEN ALGA, CHLAMYDOMONAS REINHARDTII

Abstract ID: 110

Mr. Zachary Muscavitch [1], Dr. Mark Buchheim [1]

1. University of Tulsa

The rDNA array is vitally important, and as such it is present in multiple copies within a genome. This array was long thought to be kept homogeneous (with identical sequences) via concerted evolution, however recently numerous studies report significant intragenomic variation within this array, specifically in the ITS2 region. To test the hypothesis that concerted evolution is relaxed in asexual organisms, we will mate the sexual alga, *Chlamydomonas reinhardtii* and will compare the intragenomic variation of the parents with the intragenomic variation of the progeny.

For this study we will mate the five compatible sexual strains of *C. reinhardtii* and isolate each of the 4 products of meiosis yielding 24 daughter cultures. Then extract and amplify the DNA from the parents and the progeny of the crosses and generate reference sequences via Sanger sequencing. Primers will be developed to specifically bind to ITS2, and a modified qSeq protocol will be used to assess copy number of ITS2 within the genome. Finally, the intragenomic variation will be assessed using the Illumina MiSeq platform.

This work will be the first of its type to analyze a sexual alga and will complement an earlier study on an asexual alga. Results from this experiment will shed light on the heritability of intragenomic variation and will also increase our understanding of copy number variation in this scientifically important model organism.

INVESTIGATION OF THE ROLE OF LIGHT IN THE VISIBLE-LIGHT PHOTOCATALYZED ACTIVATION OF N-HALOSUCCINIMIDE REAGENTS

Abstract ID: 107

Mr. Eric Ko [1], Ms. Megan Hopkins [1], Dr. Angus Lamar [1], Mr. Austin Lignieres [1]
1. University of Tulsa

Electrophilic aromatic halogenation is a critically important transformation in the synthesis of intermediates and end-targets in a wide range of fields that depend upon the construction of relatively complex molecules. Our research group has recently developed an approach toward halogenation of arenes that utilizes visible-light photocatalysis to activate stable, inexpensive N-halosuccinimide reagents. The results from a series of control reactions and experiments designed to probe the mechanism of the new methods for halogenation with regard to the effect of light upon the reaction/photocatalyst will be presented.

KINETICS OF THE NON-ENZYMATIC HYDROLYSIS OF AQUEOUS L-ARGININE ETHYL ESTER IN VITRO

Abstract ID: 104

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1. University of Tulsa, 2. The University of Tulsa

L-arginine ethyl ester (LAEE) is a widely used sports supplement in the bodybuilding community for its ability to increase athletic performance. LAEE may be taken instead of L-arginine due to claims that the ester form allows for better bioavailability leading to lower doses required, though these claims have not been proven. For these claims of increased absorption to be true, LAEE must not hydrolyze into L-arginine and ethanol before being absorbed, which occurs in the various conditions of the body. A study of NMR analysis to quantify the rate of hydrolysis as a function of pH value, temperature and buffer concentration was performed. The experimental rate law of the hydrolysis of LAEE and a hypothesized mechanism are reported.

ORGANICE DYE, VISIBLE-LIGHT PHOTOCATALYTIC IMIDATION OF ARENES USING N-HALO REAGENTS

Abstract ID: 100

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1. *The University of Tulsa,* **2.** *University of Tulsa*

Direct C-H functionalization of arenes and heteroarenes with the incorporation of N-aryl bonds is a valuable transformation due to the prevalence of aromatic amines in advanced materials, pharmaceuticals, and agrochemicals. Previous systems utilize expensive transition metal catalyzed/promoted methods of arene funtionalization. However, recently, a number of systems have been developed as mild, light-promoted alternatives. These alternative systems operate through a N-centered radical (NCR) approach and typically require the synthesis of NCR precursor, a transition-metal photocatalyst, and/or a radical initiator. Our research group has recently discovered a non-metal catalyzed imidation reaction that utilizes a commercially available N-halo reagent under mild conditions. Our progress toward the development of an inexpensive and practical method for incorporation of C-N bonds to arenes via an organic dye, visible-light photocatalytic approach will be presented.

PROMOTING HEALTH AND RESILIENCE ON COLLEGE CAMPUSES: AN EXAMINATION OF THE UNIVERSITY OF TULSA'S BICYCLE ENCOURAGEMENT PROGRAM

Abstract ID: 116

Ms. Hannah Walker [1], Dr. Lisa Cromer [1], Ms. Mary Rischard Kimrey [1]

1. *University of Tulsa*

College students are at an increased risk for developing unhealthy lifestyles (Racette et al., 2005). Some of these health-related threats include poor eating habits, increased stress, and lack of consistent exercise, all of which can lead to poor physical, mental, and emotional health in students (Racette et al., 2005). Furthermore, poor health negatively influences college retention (Habley & McClanahan, 2004). International and freshmen students are at an increased risk for drop-out (Barefoot, 2004; Mamiseishvili, 2012). Bike sharing programs (BSP) can mitigate health problems and improve retention for at-risk students, by promoting physical activity and by offering reliable transportation that facilitates access to community resources (Dill, 2009; Cohen, Boniface, & Watkins, 2014). Thus, BSPs can foster health and resilience for at-risk students, and improve undergraduate retention rates. The University of Tulsa Rider Network (TURN) is a BSP that has invested in a bicycle fleet and in bicycle maintenance stations across The University of Tulsa (TU) campus. In order to determine if TURN serves as a resilience resource for at-risk students, the current study examined archival data about TURN users. TURN user demographic data from the 2015-2017 academic years was used to answer this query. We conducted chi-square analyses in order to determine if TURN users are proportionally representative of the TU student population, or whether TURN is over or under utilized by the most at-risk students. Findings will inform University retention-related programming.

RELATIONSHIP BETWEEN SOCIOECONOMIC FACTORS AND PSYCHOLOGICAL WELL-BEING AND RESILIENCY IN COLLEGE STUDENTS

Abstract ID: 102

Mr. Kyle deVries [1], Ms. Elisabeth Akeman [1], Dr. Robin Aupperle [1]

1. University of Tulsa

Introduction: College students are at increased risk for experiencing anxiety and mood disorders compared to the general population, impacting academic and career outcomes. The demand on university psychological services has also been increasing, indicating a need for strategies to address students' psychological health. Preventative teaching of cognitive-behavioral and mindfulness skills has had a positive impact on college students; and identifying factors that may influence students' ability to benefit from such training may inform optimization of such programs. Previous research shows that lower economic stability increases stress levels and likelihood to experience anxiety and depression. However, it is unclear what role socioeconomic factors play in the psychological well-being of students and their responsiveness to resiliency training.

Methods: 365 first-year undergraduates at the University of Tulsa enrolled in a longitudinal study designed to assess the impact of resiliency training on psychological well-being and academic outcomes. The resiliency training consisted of four sessions during select orientation classes. Spearman's rho correlation analyses will be used to examine relationships between baseline parental income, financial aid type, and NIH PROMIS Depression and Anxiety measures. Additionally, the potential moderating effect of socioeconomic variables on resiliency training outcomes will be assessed, using linear mixed models to determine the impact of training group and socioeconomic factors on depression symptoms at end of first semester. As the first author on this abstract is a university student, all data has been de-identified prior having access.

Results and Conclusions: Data is currently being organized and quality checked. Results of analyses will be included at time of presentation.

SOUTHERN OKLAHOMA IGNEOUS PROVINCE AS SEDIMENT SOURCE

Abstract ID: 115

Ms. Roberta Thompson [1], Dr. Dennis Kerr [1]

1. University of Tulsa

Geochemistry of modern weathering on Pennsylvanian age Atoka Formation fine grained sediment in the Ouachita Trough is investigated alongside Southern Oklahoma Igneous Province (SOIP), and continental crust to determine if SOIP is a likely source of sedimentation and what effect modern weathering has on mudrocks. Recently published geochemical data for SOIP reveals a felsic and mafic igneous type sedimentation representative of the Atoka Formation chemoprovenance mudrock that may challenge geological paradigm models. Geochemical accumulations of 166 rocks to include data obtained from Oklahoma Geological Survey SOIP, average continental crust (glacial till, present upper and lower continental crust, and Archean upper crust), and field samples collected within the Atoka Formation of the Ouachita Mountains are investigated. Index of Compositional Variability values indicate cratonic and inactive tectonic environments for sampled Atoka Formation mudrocks. Evaluation of trace element compositions places the Atoka mudrocks regionally in the upper continental crust and though no sign of ophiolitic components, trace element ratios infer a mafic deposition. Geochemical analysis of modern weathered Atoka Formation mudrocks do show promising indications that SOIP may be a liable source of sedimentation despite paleogeographic reconstructions establishing SOIP in the subsurface during deposition of the Pennsylvanian Period formations in the Ouachita Trough.

THE EFFECTS OF LOAD CARRIAGE ON DYNAMIC BALANCE

Abstract ID: 108

Ms. Harley Matheson [1], Dr. Roger Kollock [1]

1. *University of Tulsa*

INTRODUCTON: Musculoskeletal injuries are a common occurrence in military warfighters. Arguably, personal protective equipment (PPE) and rucksack loads may play a role in this increase susceptibility to injury in warfighters by altering stability and movement quality during performance of job related activities. The objective of this project was to determine the influence of PPE and rucksack carriage on dynamic balance.

STATEMENT OF METHODS: The study was a repeated measures design. Eleven (5 males; 6 females) recreationally active participants (age, 20.18±.75 years; height, 170.87±10.23 cm; weight, 68.17±13.87 kg) were recruited. Participants performed the y-balance test under three different conditions: no equipment, PPE and PPE with 40 lbs. rucksack. Each condition was separated by a 10-minute rest period. To perform the y-balance test, participants stood on their dominant leg at the center foot plate of the test instrument and reached as far as possible with the foot of the nondominant leg in the anterior, posteromedial and posterolateral directions. The distance reached in each direction was recorded. The reach distances were normalized according to the participant's leg length. The normalized reach distances in the three directions were averaged to calculate a composite reach distance. A one-way repeated measures ANOVA was used to compare the three different conditions.

SUMMARY OF RESULTS: Normalized composite reach did not significantly ($F_{(2,20)} = 2.482$, p=.109, $\eta 2$ p=.199) change across conditions.

STATEMENT OF CONCLUSIONS: Our results suggest that PPE alone or combined with 40 lbs. rucksack carriage does not significantly influence dynamic balance measured by the y-balance test.

THE PROTEIN KINASE INHIBITOR H-89 BLOCKS A METABOLIC SWITCH IN CELLS LACKING THE TUMOR SUPPRESSOR P27KIP1

Abstract ID: 106

Ms. Raneem Khattab [1], Ms. Ahlam Alarbi [1], Dr. Robert Sheaff [1]

1. University of Tulsa

The tumor suppressor protein p27kip1 is deregulated in many aggressive human cancers. A novel role for this protein was identified in previous work from our lab, which showed that cells lacking p27 can switch to amino acids as a carbon source when glucose levels are low. The goal of this project was to investigate the mechanism of the switch using the kinase inhibitor N-[2-(bromocinnamylamino) ethyl]-5-isoquinoline sulfonamide, or H-89. This drug inhibits several protein kinases, one of which is Protein kinase A, which is known to play an important role in cellular metabolism. Cells with and without p27 were distributed in a 96 well plate and allowed to attach. They were then treated with different concentrations of H-89 for various times. Effects on ATP production were monitored using a luciferase-based assay. Effects of H-89 on nutrient usage in cells with and without p27 were determined by monitoring glucose levels in the media to measure how much glucose was consumed. H-89 appears to force cells lacking p27 to use glucose, possibly by inhibiting glutaminolysis. Consistent with this result, the p27 -/- cells were more sensitive to the glycolysis inhibitor 2 deoxy-glucose (2DG) after adding H-89. The ATP levels were also decreased, which was measured using CellTiterGlo^{TM}, a luciferase-based assay that correlates the amount of light produced to ATP levels in the cell. Taken together these results suggest that protein kinase A activity, or that of another kinase targeted by H-89, is required for the metabolic switch in p27-/- cells. These observations will contribute to ongoing efforts to develop methodologies for specifically targeting cells lacking the p27 tumor suppressor, which may prove therapeutically valuable for treating aggressive cancers.

THE ROLE OF EXECUTIVE FUNCTION IN PREDICTING CHILDREN'S RESPONSIVENESS TO A COGNITIVE BEHAVIORAL THERAPY FOR TRAUMA-RELATED NIGHTMARES

Abstract ID: 113

Ms. Mary Rischard Kimrey [1], Dr. Lisa Cromer [1]

1. *University of Tulsa*

Children exposed to trauma are at risk for developing a constellation of stress-related symptoms including trauma-related nightmares and sleep problems (Cohen, Mannarino, & Deblinger, 2012). Although sleep-related concerns are prevalent and impairing following trauma (Connolly, McClowry, Hayman, Mahony, & Artman, 2004), they can be mitigated through cognitive behavioral treatment (CBT). Exposure, Relaxation, and Rescritpting Therapy for Children (ERRT-C; Fernandez et al., 2013) is a CBT that addresses trauma-related nightmares and associated sleep difficulties. However, ERRT-C has differential impacts on children (Fernandez et al., 2013; Kaier, 2017). It is possible that higher order cognitive processes impact the optimal benefits of CBT in children. Executive functions (EF) are a set of higher order cognitive abilities that enable goal-directed behavior in children (Miyake et al., 2000). Poor EF is related to PTSD (Beers & De Bellis, 2003), sleep problems (Sadeh, 2007), and nightmares (Simor et al., 2012), and strong EF is related to resilience (Masten, 2015) and better socio-emotional functioning (Best, Miller, & Jones, 2009). Given the protective utility of EF, we sought to examine whether higher EF was related to better treatment outcomes within a sample of 22 children presenting with trauma-related nightmares. Results from discriminant function analyses will be presented. Analyses used pre-treatment standardized EF data as the predictor and qualitative descriptors of clinical change across our three outcomes - nightmare distress, PTSD symptomology, and sleep quality - as the dependent variables (Wise, 2004). Implications for treatment recommendations and planning for traumatized children will be discussed.

USING CURCUMIN TO TARGET CANCER CELLS WITH DEREGULATED P27KIP1

Abstract ID: 112

Ms. Julia Parackal [1], Dr. Robert Sheaff [1], Ms. Kaitlin Counter [1]

1. *University of Tulsa*

P27, a well-known cell cycle inhibitor, is deregulated at the protein level in many types of aggressive cancers. Recent work in our lab revealed cells lacking p27 can switch to amino acids as a carbon source in low glucose conditions. The switch could also be activated by the glucose analog 2-deoxyglucose (2DG). Because amino acids are metabolized via the TCA cycle, combining 2DG with the electron chain inhibitor rotenone synergistically and specifically targeted p27-/- cells. These results suggest 2DG combination therapy might be an effective therapeutic for targeting aggressive cancers with deregulated p27. Rotenone is toxic, however, so other compounds were screened for synergy with 2DG. Cells with and without p27 were treated with the compounds and 2DG alone and in combination, followed by analysis of ATP levels using the CellTiterGlo[TM] assay from Promega. Curcumin showed promise, specifically reducing ATP levels in cells lacking p27 when 2DG was included. Curcumin is the curcuminiod in the spice turmeric, has been used extensively in Ayurvedic medicine, and is known to exhibit anti-tumor activity. We hypothesize that these effects may be mediated through targeting cancers with deregulated p27. Work is ongoing to optimize the use of 2DG and curcumin as combination therapy to specifically target these aggressive cancers.

USING NANOPARTICLE-BASED SPECTRAL FILTER TO IMPROVE THE EFFICIENCY OF SOLAR SYSTEMS

Abstract ID: 98

Mr. Matthew Baldwin [1], Mr. Ebrima Tunkara [1], Dr. Kenneth Roberts [1]

1. *University of Tulsa*

Efficiency of Photovoltaic (PV) cells are limited by the conversion of photons to electrons inside a PV cell, but also by the amount of radiation from the solar spectrum a PV cell is able to convert to electricity. The light absorption range in PV cells is mostly narrow, thus solar radiations outside the range are mostly lost to the environment through reflections. For e.g., the UV, Visible and NIR radiations are not utilizable by a silicon PV cell. Therefore, if these non-bandgap energies could also be absorbed and converted into thermal energy, then that thermal energy could be used to produce additional electricity through applications such as in steam turbines. One of the approaches in cogenerating electricity and disparchable thermal fraction is by integrating a thin solar filtering layer in hybrid PV systems. The filter for a silicon cell in a hybrid solar system should consists of NIR and UV-Vis absorbing nanoparticles such as Indium Tin Oxide (ITO) and Gold respectively to effectively filter off the non-bandgap radiation from the solar spectrum. The absorption efficiency of these nanoparticles depend on concentration, size, dopant concentration, etc. ITO and Au nanoparticles were synthesized, suspended in a heat transfer fluid and heated to 300°C (proposed working temperature of a hybrid solar system). The optical properties of the before and after heating samples were monitored using IR and UV spectrometer, result from which showed direct correlation between light absorption and temperature. The observed enhancements in the optical properties are attributed to the redistribution of tin in ITO, and breakage of large clusters in Au nanoparticles.

USING NORMATIVE INFORMATION TO DISCOURAGE INSUFFICIENT EFFORT RESPONDING IN SURVEY RESEARCH

Abstract ID: 103

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This study investigated the use of a survey warning statement with normative information to reduce the incidence of insufficient effort responding on survey items. Insufficient effort responding (IER) consists of a lack of attention or effort toward one's responses to survey items; as a result, the responses do not reflect the individual's true standing on those items. Based on past research on the effectiveness of warning statements added to the beginning of surveys, as well as research on social conformity, we sought to determine whether survey respondents will be more attentive and accurate in their responses after being informed via a written statement that attentive responding is the social norm.

For this study, 242 Mechanical Turk users completed a survey consisting of items from the International Personality Item Pool as well as certain IER indices such as instructed response items. Additional IER indices regarding the reliability and variability of responses were calculated using participants' responses to the personality items. We anticipate conducting a Mixed Factorial ANOVA to assess the independent variable of warning type as well as the variable of time points throughout the survey. After analysis, we will be able to provide results and discuss the subsequent implications. Our discussion will address the apparent effectiveness of normative information and warning statements in deterring IER as well as considerations and recommendations regarding Mechanical Turk as a source of survey respondents.

VISUALIZING SELF-ADAPTIVE PLAN SIMULATIONS GIVEN EMBEDDED VERIFICATION CONCERNS

Abstract ID: 105

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A system that dynamically self-adapts at runtime, should comply with critical requirements. However, runtime verification is difficult even when the system was originally formulated to expect adaptation and allowable changes are preconfigured or prespecified. Our approach examines verification processes originally performed for compliance with system requirements to identify specific verification concerns, such as variables, safety and liveness property conditions, and architecture properties. The expectation is that if a verification concern is impacted by an adaptation then the reuse of the original verification process may be restricted. If verification process reuse is inhibited, then there is increased likelihood that the requirements relying on that verification concern may no longer be guaranteed. In this demonstration, we illustrate our approach to take identified verification concerns for each requirement and embed them as checkpoints within the code, given the flow of the verification process from which they were derived. Simulating an adaptation plan produces log files based on which checkpoints are reached. Failure to complete a path through the checkpoints without raising a flag indicates that the verification process may not be repeatable, and the adaptation plan may be risky to perform. We visualize the paths using ProM which shows where and how an adaptation plan may be problematic.

OTHER

DOES EARLY DEPRESSION SCREENING INCREASE POSTPARTUM DEPRESSION DETECTION? AN FPIN© EVIDENCE-BASED REVIEW

Abstract ID: 74

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Purpose: Review the current evidence for improved detection and treatment of postpartum depression when screening is completed at infant's 2-week well-child check compared to mother's 6-week postpartum visit.

Methods: PubMed and OVID Medline were searched for studies published from 2010-2017 using terms *postpartum depression, screening,* and *well-child.* Following FPIN© methodology for evidence-based HelpDeskAnswers© reviews, 2-5 articles were chosen based on level of evidence.

Results: A 2017 prospective study evaluated the effectiveness of postpartum depression (PPD) screening by the Edinburgh Postnatal Depression Scale (EPDS) at well-child visits compared with usual care. Intervention group mothers (N=1843) completed the EPDS at 1-, 3-, and 6-months postpartum, with secondary assessments for psychological health at 3 weeks, 9 months, and 12 months. The usual care group (n=1246) received well-child visits at 3 weeks and 9 and 12 months, but did not receive EPDS screening or secondary assessments. The primary outcome was presence of depression at 9-months postpartum. The intervention group showed significantly less major depression at 9-months postpartum compared to the control group (0.6% v. 2.5%; Adjusted Odds Ratio [OR] 0.28; 95% CI, 0.12–0.63).

A 2009 prospective trial of 199 low-income, adolescent mothers at an adolescent-oriented maternity program determined the prevalence and incidence of PPD at well-child visits. Mothers completed the EPDS at 2-week, and 2-, 4-, and 6-month well-child visits. Prevalence of PPD was 17.0% at 2 weeks, with 16.5%, 10.3%, and 18.5% at 2-, 4- and 6–months, respectively. The 2-week score was unreliable, with a positive predictive value of a 2-week positive screening for a later one at 64%.

A 2016 retrospective cohort study examined the predictability of an early EPDS score. Women were screened with the EPDS within 96 hours post-delivery, then screened at a 2-8 week postpartum visit. The 96-hour post-delivery EPDS scoring showed a moderate positive correlation with screening completed 2-8 weeks postpartum (r=.63, *P*<.001). An EPDS score of <10 within the first 96 hours post-delivery had a >90% likelihood of continued negative screening in a later postpartum period.

An American Academy of Pediatrics clinical report on recognition and management of postpartum depression recommended PPD screening be integrated into the 1-, 2-, 4- and 6-month well-child visits.

Conclusion: There is limited research investigating early screening for postpartum depression. It is unclear if early screening would be more efficient at detecting postpartum depression. There is, however, evidence that earlier detection of maternal depression would allow for earlier treatment.

DOES INTERNET-BASED HEALTH INFORMATION CHALLENGE THE PATIENT-PROVIDER RELATIONSHIP? AN FPIN© EVIDENCE-BASED REVIEW

Abstract ID: 82

Dr. Kyra Hammonds [1], Dr. Wayne Raneiro [1], Dr. Viviane Sachs [1]

1. *University of Oklahoma Health Sciences Center, OU-Tulsa*

Purpose: Review current evidence examining impact on the patient-provider relationship when patients obtain health information from the internet, with potential for future study.

Methods: OVID Medline, PubMed, and Cochrane Review databases were searched from 2007-2017, using key terms *internet-based health information, patient-provider relationship,*and*e-health*. Based on FPIN© methods for HelpDeskAnswer© evidence-based reviews, 2-5 articles of highest levels of evidence were selected.

Results: A 2017 mixed methods systemic review of 18 articles reviewed patients' internet health-information seeking activity and its influence on patient-provider relationships. Data were collected through email, focus groups, semi-structured interviews, and telephone surveys. Eight studies examined internet activity and the quality of the patient-physician relationship. Qualitative synthesis of 7 of the eight revealed that seeking health information via the internet either had no effect on or improved the patient-physician relationship. However, improvement was dependent on whether the patient discussed the information with the physician and on their prior relationship.

A 2017 cross-sectional study surveyed 718 adults via Facebook or email on how the effects of searching online health information affected their relationship with their provider. A Likert scale (1-5, *never* to *always*, with a *no opinion* option) was used to measure responses. After online searching, 57% expressed more confidence in their provider. In the same study, a qualitative telephone survey of 9 physicians was used to determine whether obtaining online health information impacted consultation with the provider. Seven of nine providers (78%) indicated that an internet search did not affect the patient's confidence in the provider, while 88% reported positive effects on the doctor-patient relationship.

A 2017 study examined data from the Health Information National Trends Survey (N=3185) to determine if e-health consumption positively predicted patient participation in pursuing health information from doctors. HINTS uses a nationally representative sample of people living in the US to collect data on a variety of health information issues. Using structural equation modeling, the study showed that patients with general online health information seeking activity were more involved in requesting information from their doctors (β=0.07 [SE=0.04], *P*<.001). Patient involvement with their doctors was positively associated with perceived health care quality (r=0.13, *P*<.001), but this effect was negatively associated with health care providers who used low levels of patient-centered communication (β=-0.08 [SE=0.02], 95% CI, -0.12 to -0.03).

Conclusion: Patient use of internet-based health information ultimately had a positive impact on the patient-provider relationship, and was heavily influenced by provider engagement and communication.

DOES ROUTINE SCREENING FOR DIABETES MELLITUS IMPROVE OUTCOMES? AN FPIN© EVIDENCE-BASED REVIEW

Abstract ID: 73

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Purpose: Review current evidence for improved cardiovascular and mortality outcomes with routine diabetes screening.

Method: Using FPIN© HelpDeskAnswer© evidence-based review methodology, OVID Medline and PubMed were searched for studies published from 2012-2017 using terms *diabetes, screening, mortality, cardiovascular,* and *outcome.* Per FPIN©, 2-5 references were selected out of 10 based on level of evidence.

Results: A 2017 registry-based non-randomized controlled trial of Danish adults evaluated the effect of population-based screening for Type 2 diabetes (DM2) on mortality and cardiovascular events. The intervention group (screening-diagnosed diabetics) comprised individuals registered with the Danish ADDITION study without known diabetes and identified as moderate-to-high cardiovascular risk. The control group (no screening) were adults not registered for the ADDITION study. A 9.5-year follow-up period found 7.7% deaths in the screening-diagnosed group and 8.1% in the control group [Hazard Ratio (HR) mortality 0.99; 95% CI, 0.96-1.0]. First cardiovascular events were seen in 12% of both the screening-diagnosed group and control group (HR 0.99; 95% CI, 0.96-1.0).

A 2017 registry-based retrospective cohort of Swedish adults evaluated all-cause mortality and cardiovascular disease outcomes in patients with DM2 detected by either screening or clinical diagnosis. The screening-diagnosed group included patients with positive screens and subsequent confirmation of DM2 (via WHO criteria). The clinically-diagnosed group included patients who presented with DM2 symptoms and had subsequent confirmation diagnosis. A 13-year mean follow-up period found 76% mortality in the screening-diagnosed group and 84% in the clinically-diagnosed group (HR 0.99; 95% CI, 0.83-1.2). There was a 69% incidence of cardiovascular events in the screening-diagnosed group and 71% in the clinically-diagnosed group (HR 1.2; 95% CI, 0.97-1.4).

A 2017 population- and registry-based retrospective cohort study of Swedish adults without known DM2 evaluated whether screening-diagnosed DM2 was associated with better outcomes for all-cause mortality and cardiovascular disease than clinically-diagnosed DM2. The screening-diagnosed group was confirmed via confirmatory testing. The clinically-diagnosed group included patients with the diagnosis of DM2 on medical or prescriptive records. A 10-year follow-up period showed significantly higher all-cause mortality rate in the clinically-diagnosed group than in the screening-diagnosed group (HR 2.1; 95% CI, 1.6-2.6). A significantly higher incidence of cardiovascular events was observed in the clinically-diagnosed group than in the screening-diagnosed group (HR 1.6; 95% CI, 1.3-1.9).

Conclusion: Screening for diabetes does not improve mortality or cardiovascular outcomes compared to no screening. There is conflicting evidence of improved mortality or cardiovascular disease incidence when comparing screening-diagnosed diabetes and clinically-diagnosed diabetes.

IDENTIFYING THE NEEDS OF GRANDPARENTS RAISING THEIR GRANDCHILDREN: A SYSTEMATIC REVIEW

Abstract ID: 70

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1. University of Oklahoma - Tulsa

Introduction: Grandparents providing primary care for their grandchildren is a growing phenomenon. Parental incarceration, drug and alcohol problems and domestic violence are among the many reasons grandparents are called upon to care for grandchildren. Grandparents assume care in a variety of capacities, including informal caregiving arrangements, legal guardianships, and out of home kinship care through the child welfare system. This review identifies the needs of grandparent caregivers in this increasingly common family structure, as well as interventions to effectively address those needs.

Methods: Cochrane guidelines for conducting systematic reviews were followed. Electronic searches for relevant studies conducted within the last 10 years were conducted in five databases. Studies were excluded from consideration if they were not published in English, did not occur within the United States, and did not address the grandparent caregiver role. Manuscripts evaluating kinship caregiver roles that did not report findings specific to grandparent caregivers were also excluded. This systematic narrative review evaluates findings from the remaining 28 articles meeting the study's inclusion criteria.

Results: Findings suggest grandparents raising grandchildren face unique financial, legal, health, social, and emotional challenges. Needs of grandparents raising grandchildren vary across populations, cultures, and demographics, but many experience increased rates of stress, depression and physical health complaints. Many grandparents live on fixed incomes, so the additional burden of raising children causes financial strain. Additionally, some grandparents find lack of legal custody contributes to difficulties in being able to access medical and behavioral health services for their grandchildren. These needs are exacerbated when grandparents are raising children with increased behavioral health needs or physical disabilities. Programs providing grandparents with financial provisions, housing assistance, social support, and assistance navigating legal barriers are among the most effective at addressing grandparent needs.

Conclusion: Even though the health and emotional wellbeing of grandparent caregivers are adversely affected when caring for grandchildren, grandparents willingly assume the primary caregiver role. The benefits of their love, support and financial assistance to children can never be fully compensated, but at the very least grandparents raising grandchildren deserve programs and services to assist them in caring for future generations. Support programs are beginning to be implemented to support this specific population, but considerable needs remain. Suggestions for practice, policy and research interventions conclude this review.

TRANSFORMATIVE INTERACTIONS, SOCIO-MORAL CLIMATE, PSYCHOLOGICAL ENGAGEMENT AND THE SUCCESSFUL TRANSFER OF LEARNING

Abstract ID: 54

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1. *University of Oklahoma Outreach - National Resource Center for Youth Services,* **2.** *University of Oklahoma*

Background: In 2016, US companies collectively spent nearly 71 billion dollars on training and development programs. In exchange for this investment in learning, organizations are expecting to see returns in the form of increased work performance, increased innovation, and improved management of important knowledge resources. However, while current evidence clearly suggests that training, when properly developed and executed does work, many training programs fail to deliver these important returns on expectations, commonly referred to as the transfer of training. In response, there has been a pivot from traditional training programs to a focus on supporting continuous learning processes using both formal and informal learning strategies. . To be successful, however, these types of continuous learning systems require a sustained level of high psychological engagement on the part of learners. To answer the question of how sustained transfer can be influenced at the organizational level, a practical model for supporting the sustained transfer of continuous learning is needed.

Methods: To develop a hypothetical model for sustained learner engagement, eleven peer-reviewed meta-analyses of predictors for learning transfer over the last fifteen years were reviewed. Following a review of the transfer literature, specific constructs related to the strongest predictors of transfer were selected to build a model for sustained transfer of learning.

Results: Three key factors related to the successful transfer of knowledge emerge from the literature: (1) needs-based interactions with supervisors, (2) an organizational climate that supports transfer, and (3) engagement in the learning process at the individual level. Transformational Leadership, Socio-Moral Climate, and Work Engagement assess these constructs and have reliable and valid measurement tools. Therefore, to support sustained transfer at the organizational level, it is hypothesized that a transformational leadership approach and a positive socio-moral climate, partially mediated by sustained learner engagement, will positively influence better transfer results in a continuous learning system.

Conclusion: The learning experience matters. When learners' psychological needs are met, they are more engaged and can sustain a long growth process, including the application and practice of new knowledge, skills, and abilities. To support this transfer of training, organizations should be intentional about fostering a supportive organizational climate and needs focused leadership styles.

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