Research Abstracts

1. **Amanda Carnes, Jaime Martin**

**Mentor: Claire Wilson**

*Mental Health Awareness in Rural Communities*

Members of rural communities continue to experience deficits in mental health treatment in their community as compared to urban counterparts.  Many barriers exist within the community that prevent individuals from seeking care.  Such barriers include stoicism, stigma, financial issues, lack of knowledge, and lack of providers.  This study randomly sampled 8 people from both rural and urban communities utilizing a 55-question web-based survey.  Seeking to answer if there is a barrier to accessible competent mental health care in rural and urban communities and the awareness of the individuals understanding of resources available? Results were consistent with current literature regarding a need for normalization of mental health, and accessible specialized mental health care.  No significant difference was found between rural and urban communities.  Mental health awareness would benefit from continued research with larger sample size.

1. **Jenna Law, Ashley Burgess**

**Mentor: Lora Wyss**

*Transition Readiness and the Impact of Health-Related Quality of Life in Young Adult Patients with a Congenital Heart Defect*

In recent years, there has been an attempt to identify barriers to the transition of care and discover ways to make the process of moving from a pediatric to an adult care team more fluid in order to decrease the care gap for this growing patient population. The purpose of the research study was to investigate and explore the relationship between transition readiness and the health related quality of life in young adults (18-25 years-old) with congenital heart disease. This study aimed to identify potential barriers to patients making the transition from pediatric to adult health care. A convenience sampling method was utilized as participants were determined appropriate by the inclusion criteria and recruited at the time of their visit to Akron Children’s heart center. Participants were identified by a gatekeeper and selected via the following criteria: 18-25 years of age, diagnosed with a congenital heart defect, English speaking, and cognitively capable of answering questions independently. This study identified barriers to completing the transition of care by assessing the patient’s perspective of the impact of their illness on their quality of life and its relationship to their independence in managing their own care; further translating into their readiness to transition to an adult healthcare provider. Due to difficulties associated with accessing the sample group, a total of fifteen participants completed the study (n=15). Preliminary findings suggested that the effects of congenital heart disease on physical and cognitive function could negatively impact their health related quality of life.

1. **Megan Demos, Chelsie Seffens**

**Mentor: Lora Wyss, Debra Lee**

*Compassion Fatigue and Emotional Intelligence in Nurses*

This study examined the relationship between compassion fatigue (CF) and emotional intelligence (EI) in nurses utilizing the Compassion Fatigue-Short Scale and Trait Emotional Intelligence Questionnaire- Short Form (TEIQue-SF). The profile of emotional intelligence and experience of compassion fatigue in this sample were explored. Additionally, the subscales of each instrument were also analyzed for presence of relationship to the demographic variables. The sample was derived from nurses employed at a 187-bed community hospital located in Northeast Ohio. Data analysis revealed multiple weak relationships between the components. Burnout (BO) and/or vicarious trauma (VT), the subscales of CF, were present in 53% of the sample. The EI profile for the entire sample was above the average score set by the instrument’s author. This factor may be acting as a protective buffer against the manifestation of CF. Findings suggest a significant number of nurses are negatively affected by CF or its components. Although findings provide good support for the need to prevent, identify, and improve CF along with its relationship to EI, emphasis on further research of how this can be accomplished is warranted.

1. **Amanda Kraciun, Justin Lonczak**

**Mentor: Rosanna Hess**

*Lived Experiences of Spouses of Women Diagnosed with Peripartum Cardiomyopathy*

Background: Peripartum cardiomyopathy (PPCM) is a rare form of heart failure that occurs during the last month of pregnancy or up to five months after giving birth. Research has previously been conducted with women who have been with diagnosed with PPCM.

Purpose: To describe the lived experience of spouses or partners of women diagnosed with PPCM.

Methods: Phenomenology was the design that guided this study. Men were recruited through a Facebook social media website. Eight men from around the world were interviewed. Data were analyzed by constant comparison.

Results: Major themes were: support systems, strengthened marriage, coping, fears, social media and online resources, and research and education.

Conclusions: The men interviewed shared their personal lived experiences with PPCM and how this diagnosis affected their families. It was concluded that increased awareness of PPCM is vital to early diagnosis and treatment. The men desired the medical profession to conduct more education and research about the effects of PPCM.

1. **Charles Novince, Julie Angel**

**Mentor: Rosanna Hess**

*Nurses working through interpreters*

Background: There are thousands of limited English proficiency (LEP) patients in Northeast Ohio. Little is known about nurses’ experiences providing patient care through interpreters.

Purpose: To explore the lived experiences of nurses using interpreters to communicate with LEP patients in Northeast Ohio

Method: Using a modified replication study with a qualitative, exploratory design, eight registered nurses participated in structured interviews. The data were analyzed by constant comparison.

Findings: Three themes with subthemes were extracted from the interviews: 1) benefits of using interpreter included cultural competence, empathy for LEP patient, and gratifying nurse/patient interactions; 2) challenges of interpreter use included time restraints, limited experience, and miscommunication; 3) lack of interpreter use included misuse of interpreter, lack of use by physicians, and lack of use of by patients.

Conclusion: Interpreting services are an essential component of healthcare success of LEP patients in Northeast Ohio. Although many struggles and complications may present during the use of interpreting services, the benefits far outweigh the challenges. With the right education, experience and future research, interpreting services can be utilized to improve patient care.

1. **Chelsea Ruhl, Sherri Brunsdon**

**Mentor: Rosanna Hess**

*Adolescent Refugee Language Brokering Experience*

Background: Little is known about the personal experiences of adolescents who serve as language brokers in health care settings for members of their resettled refugee families in northeast Ohio. Purpose: To explore the experiences and perceptions of Burmese and Bhutanese adolescents who served as language brokers

Methods: Convergent mixed methods design including photovoice guided this study. For the qualitative arm, photographs, journaling, and two focus groups were used to collect data; for the quantitative arm, all participants completed a survey.

Results: Eight teenagers, five females and three males, ages 15-17 years, participated.

Frequency of translating varied from once a month to daily, for parents, siblings, family and non-family members. Their emotional reactions to language brokering included: nervous (87.5%), proud (87.5%) calm and determined (50%), confident (25%), ashamed (12.5%). Photographs taken by participants and explained in journals included medications, documents, a pharmacy, cell phones, etc. The main finding from the focus groups, where participants shared photos and journal entries, is that the participants felt proud to be a language broker and yet felt guilty when they did not translate because their families relied heavily on them.

Conclusion: More research is needed to explore long-lasting psychological effects these adolescents experience.

1. **Alyana Barnes, Lora Karg**

**Mentor: Stephanie Burgess**

*The Underreporting of Violence in the Emergency Department*

Violence in the healthcare setting is a global issue. We are exploring how staff defines violence and common barriers to reporting violence. The aim of this research is to evaluate factors that contribute to the underreporting of violence in the emergency department. Violence leads to increased staff turnover, increased error by staff, and decreases the overall well-being. This research will be conducted at one Northeast Ohio Hospital. Providing a safe work environment benefits the staff, patients, visitors, and their family. Our research design includes a pre-survey, an educational offering, and concludes with a post-survey analysis. Participants were asked on the survey, individual experience with reporting violence and common barriers they perceived in reporting violence.

1. **Laura Penix, Jessica Bailey, Alix Melville**

**Mentor: Stephanie Reagan, Julia Hooley**

*A Retrospective Chart Review of Open-Heart Surgery Patients with Sleep Apnea or the Predisposition to Sleep Apnea*

A retrospective chart review was conducted to determine if open-heart patients with the associated comorbidities of heart failure and obstructive sleep apnea or the predisposition to sleep apnea had different postoperative experiences than those without these comorbidities. The researchers investigated increased postoperative complications by measuring oxygen wean times, length of stay in the Intensive Care Unit (ICU), and occurrence of arrhythmias. The literature review indicated that research including these specific comorbidities after open-heart surgery have not been studied. Investigators used mean as a measure of comparison between the control and affected groups. Measurements included length of stay in the ICU by hours, oxygen wean time by hours, and arrythmia formation post operatively. The study identified that there was greater risk of complications in the affected group as compared to the control group. The average time of oxygen use, length of stay in the ICU and the occurrence of arrythmias were all increased in the affected group as compared to the control group. The investigators believe a STOP-BANG questionnaire would be warranted in the preoperative period to enable providers to identify high-risk patients who have sleep apnea. It is suggested that use of CPAP in the immediate post-operative period following extubation of open-heart patients with a history of heart failure and a positive STOP-BANG be further researched.

1. **Jessica Swartz, Dishon Kamwesa**

**Mentor: Steven Merrill**

*Exploring the Lived Experiences of Male Nursing Students*

The purpose of this study is to understand the extent to which male nurse stereotypes affect the experiences of male nursing students, thus impacting the ability to recruit men into the field of nursing. The investigators recruited participants that are men currently enrolled as nursing students at Malone University in Canton, Ohio and male Malone University alumni who graduated within the last five years. The area of emphasis in this study was on social perception of males in nursing and how male nurse stereotypes affect male nursing students. Data was collected from the sample population via email and a survey website. After data was collected, a descriptive phenomenological methodology was used for content analysis of the narrative responses. Participant survey answers were then organized into three categories: “why nursing”, “family/friends attitudes”, and “perceived barriers”. Findings appear to show that nursing is still largely perceived as a female occupation and gender stereotypes do appear to influence the experiences of male nursing students. Further research that uses larger sample sizes and a diversity of student populations would be greatly beneficial to nursing research and to nurse leaders and educators in devising strategies to increase gender diversity within nursing.

1. **Megan Stancik**

**Mentor: Karyn Collie**

*Migration-Related Changes and Behaviors in a Captive Snowy Owl*

The Snowy Owl (*Bubo scandiacus*) is a tundra bird that nests on the ground and whose migratory behavior is little studied. In the wild their migratory patterns and behaviors vary, and they are rare visitors to Ohio. I conducted a case study on a single Snowy Owl at the Akron Zoo. For five hours each on two separate days (3/26/19 and 4/2/19) I observed the individual owl for restlessness that may be associated with the instinct to migrate or move to its traditional breeding regions (the Arctic). High energy levels (in this case, flapping and gullet flaring) and increased movement (constant head movement, pacing) are to be recorded using scan sampling every minute. These behaviors will be compared between morning observation and afternoon observation. My hypothesis is that a captive-bred Snowy Owl will not exhibit migratory restlessness. The results could help us (or the Akron Zoo) understand migratory restlessness (or lack of) in captive Snowy Owls during the transition from Winter to Spring.

1. **Megan Stancik**

**Mentor: Jason Courter**

*Prevalence of Mammalian Diseases and Illnesses in Ohio and Fluctuations with Climate Change*

Mammals such as raccoons, skunks, squirrels, rabbits, and foxes are present in Ohio and regularly received at wildlife rehabilitation centers. Seasonal changes as well as fluctuating temperatures can bring about earlier litters, overpopulation, and more frequent territorial disputes, all of which affect prevalence of disease and illness. Warmer temperatures occurring earlier in the year also encourage the survival of viruses and bacteria. The objective of this study was to both understand seasonal trends in mammalian diseases in Ohio and then understand ways that Malone University students would be well-positioned to conduct research on behalf of wildlife rehabilitation centers. I interviewed six different wildlife rehabilitation centers from February 2019 to March 2019 and found that the greatest volume of intakes were related to the incurable White Nose Syndrome in Ohio bats and mange and distemper in foxes and raccoons and that these problems were becoming more prevalent in the past 5 years. My results point to the need for increased collaboration between wildlife centers and other entities, such as universities, to optimize wildlife-related conservation, education, and research efforts in ecosystems impacted by urbanization and environmental change.

1. **Anna Kilian**

**Mentor: Karyn Collie**

*Taxonomic Level and Popularity in Zoo Exhibits*

Research has shown that visitors in museums, aquariums, and zoos spend uneven amounts of time at different exhibits. To better understand visitor choice and preferences in a zoo setting, this study, at the Akron Zoo, in their Curious Creatures exhibit, focused on popularity differences between seven classes of animals, Scyphozoa, Malacostraca, Insecta, Cephalopoda, Actinopterygii, Reptilia, and Mammalia. I measured the percentage of visitors that interacted with each enclosure. I did so by scanning the room every minute and recording the number of people at each enclosure for ten hours over the course of two days. Enclosures measured were South American sea nettle, mantis shrimp, leaf cutter ant, giant Pacific octopus, electric eel, spotted turtle, and naked mole rat. I predicted that the ant, sea nettle, naked mole rat, and turtle would be more popular than the shrimp, eel, and octopus due to how active and visible each taxon is. By measuring visitor choice, the Akron Zoo can better understand the impact different taxa have, thus understanding attendance and improving their rotating exhibits to engage more visitors.

1. **Kaitlyn Cowley and Anna Kilian**

**Mentor: Jason Courter**

*Spatial Analysis of Bull Sharks' (*Carcharhinus leucas*) and Great Hammerhead Sharks' (*Sphyrna mokarran*) Movements as a Result of Temperature Changes over Time*

Sharks are ectothermic animals and should be expected to reside in a particular range of temperatures. To study this range we used ArcGIS to plot SPOT (smart position or temperature transmitting) tagged bull sharks (*Carcharhinus leucas*) and great hammerhead sharks (*Sphyrna mokarran*) from 2012-2015. We were then able to overlay the points with both sea surface temperatures and marine protected areas. Our results show that temperature affects where sharks are and the level of protection they have. As climate change continues then there may be a need to reassess marine protected areas to give sharks the optimal protection. This project was a collaboration with the University of Miami’s Shark Research and Conservation Lab.

1. **Kaitlyn Cowley**

**Mentor: Karyn Collie**

*Human Preference for Vertebrates in Zoo Animals*

Animals and people have had a long and complicated relationship with each other. Many studies have found that people have certain biases towards animals with traits that resemble humans. My research looked at how rudimentary this similarity could be by counting the number of people at the enclosures of vertebrates and invertebrates every minute. I expected to see a preference towards vertebrates. Two vertebrate species (batfish and monitor lizard), and two invertebrate species (beetles and moon jellyfish) were used to test Akron Zoo guests’ biases towards one type or the other. This research can inform zoos about which animals or exhibits get more attention and where to focus more education efforts to overcome human bias in order to give people a more well-rounded experience at their facilities.

1. **Abigail Rootring**

**Mentor: Karyn Collie**

*Aposematic Coloration of Poison Dart Frogs at the Akron Zoo*

Poison dart frogs are known due to their bright colors of aposematic coloration, warning that they are distasteful and toxic to predators. The brightness of males is highly correlated with aggressive behavior, even when other factors such as size or calls cannot be studied. In a zoo where these species are usually housed together, aggressive behavior may increase compared to natural solitary behavior. My experimental hypothesis was that aggressive behavior would increase throughout the day due to anticipation of the afternoon feeding, particularly in frogs with more brightness. Brightness was measured based on extent of coloration and total brightness on the back and sides of the frogs from human observation. Frogs with more brightness should be more aggressive. Those with less brightness should show fewer or less frequent aggressive behaviors. This study compared aggressive behavior between poison dart frogs of different species at the Akron Zoo with time of day and aposematic coloration. Scan sampling was used every minute to record the behavior of each member of each species. Results may support that aposematic behavior is not only a communication system resulting from natural selection, but that it can also be a result of intrasexual selection.

1. **Anessa Fogle**

**Mentor: Karyn Collie**

*Effects of visitors and weather on stereotypic and resting behaviors on captive snow leopards*

In the wild, snow leopards have relatively large home ranges. In captivity, their ranges are drastically reduced. Since snow leopards are generally elusive creatures in the wild, this study looked at the effect of visitors on their behaviors and if the behaviors were stereotypic or not. This study used scan sampling to observe the snow leopard that was out on exhibit at the time, and behavior was recorded each minute. At the beginning of each 15-minute block, the number of visitors and the temperature, along with whether it was sunny, cloudy, or precipitating, was recorded. The goals of this study were to determine if there was in increase in stereotypic behaviors when there were more guests compared to when there were no guests, along with if weather had any impact on the behaviors of these snow leopards.

1. **Aubrie Miller**

**Mentor: Karyn Collie**

*Spotted Turtle Behavior at the Akron Zoo*

The Spotted Turtle (*Clemmys guttata*), is an endangered species in Ohio. Human impact has been the main issue towards the turtles and continues to be so today. At the Akron Zoo, they have two turtles in their collection that I decided to study. Being in captivity, these turtles do not experience the struggle of survival and what it means to look for food. In my observations, I look for how active they are inside their enclosure, if they use all of their space or prefer certain locations; if they have a preference between being in the water, or sun-bathing on land. Also, for any social behavior between the two turtles. I recorded activity and interaction with an ethogram. Time was recorded for how long they prefer water on land and social interactions were recorded each time. The hypothesis for this study, is that these turtles will spend more time on land sun-bathing, compared to in the water and that throughout the day they will not be as active and not use too much of their enclosure space. Studying their activity will help to improve a better understanding of these two specific turtles at the zoo.

1. **Bailee Ridenbaugh**

**Mentor: Karyn Collie**

*Ring-Tailed Lemur (*Lemur catta*) Preference on Wooden Perches and Rope Enrichment*

The Akron Zoo has two Ring-Tailed lemurs (*Lemur catta*) in a large enclosure with a variety of enrichment. Wooden branches and rope are both incorporated into the exhibit. I studied whether the lemurs would choose to use the wooden perches or the ropes on exhibit as they moved in the enclosure. I hypothesized that lemurs would prefer the wooden perches in the enclosure, as it is more like branches in their natural environment. In order to study the behavior I scanned every thirty seconds for five hours on two days. The primary behavior I observed was whether the lemurs were on the wooden perches or the ropes. I also recorded the amount of time spent on each perch. The results from this study could help us understand lemur preferences of natural versus artificial enrichment in captive settings.

1. **Breanna Woods**

**Mentor: Karyn Collie**

*Intersexual Interactions of Male and Female Siberian Musk Deer at the Akron Zoo*

Siberian Musk Deer are a species that, while predominantly solitary in the wild, are kept in pairs or groups in captivity. This study looks at the pair of musk deer located at the Akron Zoo and their intersexual interactions. Two Saturdays in March were spent observing the deer and their interactions, with focus on anogenital sniffing and affinitive interactions (direct body touching activities without conflict), such as mutual grooming and licking. All-occurrence sampling was used for those behaviors, along with scan sampling every minute for other behaviors such as pacing, resting, eating, ruminating, environmental sniffing, and others. These results can help the Akron Zoo and other zoos understand how Siberian Musk Deer interact in a zoo setting instead of a farm setting. This could help provide better insight into the decision to put pairs in an enclosure together or to keep them separate.

1. **Emelie Ruttig**

**Mentor: Karyn Collie**

*Red Ruffed Lemur Behavior*

I studied the Red Ruffed Lemur (*Varecia rubra*) and the level of aggressive behavior between co-inhabitants of an enclosure. It has been found that there is high aggression in captive Red Ruffed Lemur pairs. In the wild, these lemurs are not very social animals and live in loose associated groups that neither harm one another nor engage in pack behaviors. My hypothesis was there would be more overall aggressive behavior towards one another than play or interaction without aggressive intent. In order to record this data, I created an ethogram that divided social behaviors into three main categories: play, dominance, and submission. The results will enable the Zoological Society to house these lemurs in less stress filled environments. This will help the longevity of Red Ruffed Lemurs' captive life from the standpoints of both mental and physical health.

1. **Emma Lavelle**

**Mentor: Karyn Collie**

*Behavior Differences in Captive and Wild Himalayan Tahr*

The goal of this study was to assess whether a zoo enclosure for captive Himalayan Tahr could disrupt the Tahr’s natural “resting” and “active” cycles of behavior. Himalayan Tahr in the wild exhibit grazing activity patterns of being more active early in the morning and late afternoon, with a resting period in the middle of the day. During their active periods, they are constantly moving and grazing, while during the mid-day resting period, they exhibit resting behaviors, including laying down, grooming, and chewing. The Akron Zoo’s enclosure’s conditions were noted to be flatter than more elevated conditions that would be found in the wild, so the behavior of these captive Tahr was compared to behavior of Tahr in the wild. Resting behaviors and active behaviors were observed and recorded throughout the day. Scan sampling was done every three minutes due to there being multiple Tahr on exhibit. This study is important because it could reveal possible health risks for these animals. Encouraging natural behaviors and simulating accurate environments could be beneficial for captive animal welfare.

1. **Hayley Ellers**

**Mentor: Karyn Collie**

*The Effects on Yellow Spotted Amazon Turtle (*Podocnemis unifilis*) Behavior in Mixed Species Exhibits*

Mixed species exhibits are becoming more common as time advances, and tend to be more successful when species from the same habitat are included. However, their interactions could still be negative overall, and thus require extra monitoring. Species like the Yellow Spotted Amazon Turtle and the Freshwater Stingray are found closely in nature, but their interactions within a shared exhibit are understudied. My hypothesis was that the turtles would display signs of increased activity when in relatively close proximity to the rays. Observations of a shared exhibit were monitored over two days at the Akron Zoo. All-occurrence sampling was used to record turtle behaviors such as biting, head-butting, collision, scratching, avoidance, head retraction, and sudden speed increase. Scan sampling was also used at five minute intervals, with an estimate of distance between each turtle and the nearest ray in turtle body lengths, along with the presence or absence of any of the behaviors. The increased presence of aggressive and self-defensive behaviors in proximity to the rays may correlate with increased stress levels, while the absence of these might indicate low stress levels.

1. **Jenna Saunders**

**Mentor: Karyn Collie**

*The effect of visitor presence on stereotypic behaviors in African Lions (*Panthera leo*)*

The African Lion, *Panthera leo*, is a large feline that is historically native to a wide range across mid- and southern parts of Africa. As wide-ranging carnivores, living in a captive environment can have effects on their wellbeing. Something lions encounter in captivity that they do not encounter in the wild is the high frequency of human encounters. While on exhibit, the cats are forced to be in the presence of zoo visitors, which may cause stress. The purpose of this research is to determine if the lions become stressed when there is a higher number of visitors viewing them. The conditions that were compared while observing two lions at the Akron Zoo were the number of people present and the behaviors being exhibited by the lions. This was measured by recording stereotypic behaviors, such as pacing, head rolling, and excessive self-grooming or plucking, on an ethogram by using scan sampling and recording all occurrences of the behaviors as well as the number of people present when the behavior was exhibited. An increase in these behaviors when more people are present may suggest that their presence is causing the lions stress.

1. **Jessica Hayes**

**Mentor: Karyn Collie**

*Heterospecific Socialization in Captive African Lions (*Panthera leo*).*

African lions (*Panthera leo*) are a social big cat species. This means that in captivity, they may be more likely than other big cat species (being solitary), to interact with the general public. The hypothesis for this study is that the female will perform more social behaviors towards zoo visitors and pace in response to the lack of social stimuli. Therefore, this study focused on the female lion at the Akron Zoo and her response to limited human interaction with the public. An ethogram was set up to document her behavior through a focal sampling technique. By doing so, I was able to document different behaviors and the start and end time of each behavior. As an example, some of the behaviors I documented were paw press (pawing at the visitor glass), and a glass rub (head/body rubbing against the glass). I then compared the behaviors between when visitors were and were not present. The reason behind this was to see if the behaviors occurred more frequently, or with longer duration in the presence of visitors. Results of this study could help the Akron Zoo understand the need for socialization outside of their own species in a captive setting.

1. **Katia Gresh**

**Mentor: Karyn Collie**

*High-amplitude group calls in captive red-ruffed lemurs (*Varecia rubra*)*

In this behavioral research study, a group of captive red-ruffed lemurs (*Varecia rubra*) was observed at the Akron Zoological Park. The target behavior of the study was a high-amplitude vocalization described as a chorus, shriek, or roar in which at least two members of the group participate. I predicted that red-ruffed lemurs would exhibit a high-amplitude shrieking call during times of high activity at the zoo. There was no direct interaction or manipulation of variables over the duration of the experiment. All-occurrence sampling was used when gathering data on the high-amplitude group call. Additionally, using scan sampling, five other behaviors – vocalization, sleeping, grooming, eating, and chasing – were recorded every minute using an ethogram. The number of people present in the lemur building was recorded during both times of scan sampling and times of all-occurrence sampling, ranging from 1-7, 8-14, and >14 people. As this high-amplitude group call in red ruffed lemurs is understudied, it is important to look into the positive or negative implications of the behavior. The results of this study could help the Akron Zoo and other facilities understand the implications of this high-amplitude call and the potential effects of crowd size on lemur welfare.

1. **Katlyn "Kat" Todd**

**Mentor: Karyn Collie**

*Assessing the prevalence of abnormal repetitive behaviors in North American Rivers Otters at the Boonshoft Museum of Discovery*

The modern zoo provides humans with incredible opportunities to connect with wildlife. New strategies are constantly evolving to promote the best welfare possible for a zoo’s residents, but all such strategies begin with quantified knowledge of the challenges being faced. To assess the prevalence of abnormal repetitive behaviors (ARBs) in 2.0 North American River Otters at the Boonshoft Museum of Discovery in Dayton, Ohio, 12.33 hours of data were collected using ethograms developed on the ZooMonitor app. Under their current daily routine, these otters do not have access to their off-exhibit area except during training or exhibit maintenance. In light of previous studies that demonstrate benefits of animals having regular access to this space, the data generated by this study will not only paint a general picture of ARB prevalence in these individuals, but will also inform decisions made by the museum staff as they consider moving to a “choice”’ protocol later in 2019.

1. **Kirsten Miller**

**Mentor: Karyn Collie**

*Activity Levels Between Male and Female Snow Leopards (*Panthera unica*)*

I studied the activity levels between the male and female snow leopard (*Panthera unica*) at the Akron Zoo. I wanted to know if they spent more time being active or resting. I hypothesized that the female snow leopard would spend more resting, while the male would spend more time being active. The Akron Zoo has two snow leopards, one male and one female. The two of them are not usually out together. I looked at resting behaviors which included lying awake, sleeping, and sitting. Active behaviors included running, walking, interacting with guests, and playing with enrichment. I also monitored any other behaviors that they exhibited that were not included in the list of behaviors I was monitoring. I did a scan sample every minute and recorded the behavior that was exhibited. This research will help to see if the male and female will elicit natural behaviors while being in captivity.

1. **Lauren Millinger**

**Mentor: Karyn Collie**

*Personality Profiling the Red Ruffed Lemurs of the Akron Zoo*

Any casual observer can concede that most animals exhibit an individual personality. Scientific studies also support the idea that animals possess personalities, which can differ from individual to individual in a species. The goal for my research was to quantify these differences that we can observe in order to better care for captive animals on an individual level, regarding both general needs and enrichment. In order to do this, I recorded what behaviors were most commonly exhibited in each of the three red ruffed lemurs held at the Akron Zoo using a scan sampling method, recording behavior every 30 seconds. Behaviors included the following: resting/solitude, affiliation, exploring, play, moving, aggression, and maintenance. I then determined if the behaviors within an individual were related to one another in terms of personality traits, developing a personality profile for each of the lemurs. I designed the profiles to be as follows: solitary/neurotic (resting, aggression, maintenance), bored/aloof (resting, moving, maintenance), agreeable/social (affiliation, exploring, play), curious/open (affiliation, exploring, moving). I predict that certain behaviors will align with one another, enabling the lemurs to be roughly categorized in one of these four profiles.

1. **Madison Olson**

**Mentor: Karyn Collie**

*A Study of the Relationship between Unipedal Resting, Time of Day, Temperature, and Visitor Numbers in Chilean Flamingos (*Phoenicopterus chilensis*) at the Akron zoo.*

The Chilean Flamingo, *Phoenicopterus chilensis*, is a subspecies of flamingo found in the temperate regions of South America. Flamingos are well known for exhibiting a behavior called unipedal resting. This behavior is characterized by the bending of the elbow backwards and tucking of one leg underneath the body while standing on the other. Previous research has strongly correlated this phenomenon with weather conditions as an attempt to thermoregulate. This study sought to determine if the presence of unipedal resting is correlated with time of day, temperature, and/or number of visitors to the enclosure of Akron zoo’s Chilean Flamingo population. Scan sampling was used to record number of unipedal flamingos, temperature, and number of people in 15 minute intervals over a period of two days, spanning a total of 10 hours. The results from this study could help identify the influence of each variable to provide further insight into the understudied behavior of unipedal resting.

1. **Meghan Gabriel**

**Mentor: Karyn Collie**

*Anxious Behaviors in Snow Leopards*

 Understanding animal’s behaviors in captivity is necessary to be able to make the animals safe and comfortable. Often, animals may display anxious behaviors while in their enclosure including pacing, scent marking, and pawing. The purpose of this study was to see if anxious behaviors in snow leopards increased in the minutes around feeding time. These behaviors were described as pawing, pacing, or scratching at or around the feeding door. The snow leopards’ feeding schedules were acquired for the purpose of the experiment and were consulted throughout. All occurrence sampling was used throughout the day for the pawing and scratching behaviors with special focus around feeding time, recording each occurrence of the anxious behaviors explained above. However, scan sampling was used for the pacing behavior. My results could give insight on how to more properly feed the animals to reduce or prevent anxious behaviors, perhaps with a more random feeding schedule to simulate natural occurrences and to not allow the animal to get apprehensive around feeding time.

1. **Melissa McMeans**

**Mentor: Karyn Collie**

*The effect of vistitors on the behavior and space use of red wolves (*Canis rufus*) at Akron Zoo*

The Akron Zoo has a pair of red wolves (*Canis rufus*), and they are visible through two large glass windows. Red wolves, however, are known to be very nervous animals around people, and they often will not make themselves visible in traditionally designed enclosures. I hypothesized that red wolves would spend less time near the glass when visitors are present and visible, and they would be more likely to engage in stereotypic behaviors. Stereotypic behaviors are pacing, excessive panting, ears flat against the head, snarling, and tail tucked under belly. I split the enclosure into quadrants and marked where each wolf was every minute. The number of visitors was also observed every minute. The results will be valuable because they will allow zoo staff to better understand the stress of their animals. They can also help the zoo staff understand the space use of their animals, which will allow them to effectively place enrichment items that allow the animal to engage in naturalistic behaviors.

1. **Micah L. Goff**

**Mentor: Karyn Collie**

*How Snowy Owls in Captivity Alter Their Behavior in Response Human Presence*

Snowy Owls are large predatory birds that spend a lot of time hunting to supply food for their mates and offspring. They are also very elusive birds as their camouflage helps them blend in with most snowy environments. When they are held in captivity for extended periods of time, not only are they confined in a small space, but they are also subjected to a human presence that would not be found in their natural habitat. This new stimulus may alter birds’ behavior by increasing their activity, decreasing their activity, or potentially having no observable effect. Data will be collected using scan sampling which will record the number of people by the enclosure as well as location of the owl(s) every minute of the study. The focal point of this experiment will be to measure cage space used (near fence, middle of cage, or at the back of the cage) in relation to crowd size. The data may be used by the Akron Zoo to determine whether or not the owls change their behavior based on the high levels of human activity and whether or not a new location at the zoo would suit their health better.

1. **Michelle Brackett**

**Mentor: Karyn Collie**

*Whitespotted Bamboo Shark (*Chiloscyllium plagiosum*) Behavior in Captivity at the Akron Zoo*

This study recorded the behavior of the group of five Whitespotted Bamboo Sharks (*Chiloscyllium plagiosum*) at the Akron Zoo. Scan sampling was used every twenty seconds to record the behaviors on an ethogram chart. How they spent time utilizing their aquarium area was observed, with attention to whether they stayed more in the pelagic or benthic sections of the water column. Specific behaviors recorded included the type of locomotion the sharks used to get around the tank, either by swimming or ‘walking’ with pelvic fins when they were not resting and sedentary. Intraspecific interactions between *C. plagiosum* individuals, along with interspecific interactions of *C. plagiosum* with the other species in the tank (the Porkfish, *Anisotremus virginicus*), were monitored to help determine levels of aggression or confrontation displayed. Behaviors recorded for these interactions were monitored all-occurance and included any touching with fins, head, or face between individuals and the duration of each interaction. These results can be helpful for aquariums and private owners to better understand captive carpet shark species and their care requirements.

1. **Mykal Shupe**

**Mentor: Karyn Collie**

*Effects of People on Ring-Tailed Lemurs at the Akron Zoo*

The purpose of this research was to look at the effects of people on the behavior of the ring-tailed lemurs at the Akron Zoo. The presence of people around their enclosure might cause the lemurs to elicit stereotypic behaviors. My hypothesis was that the lemurs would elicit more stereotypic behaviors when there were more guests around the enclosure and the viewing area. Scan sampling was used every minute to record if any stereotypic behaviors were being elicited, along with the number of guests at or around the enclosure area. An example stereotypic behavior that I looked for was pacing. The results from this study could be used by the Akron Zoo, or any zoo, to determine what might be causing stereotypic behaviors in their ring-tailed lemurs. These results could also help the Akron Zoo with their knowledge about their own captive ring-tailed lemurs.

1. **Panthera Miley**

**Mentor: Karyn Collie**

*Akron Zoo's Freshwater Stingrays*

Freshwater stingrays are a species of stingray that lives in the Amazon rivers instead of the oceans. This species is known to be docile and only attack, by using their barbs on their tails, when threatened. The freshwater stingrays at the Akron Zoo are housed with some Midas cichlids and a few yellow-spotted Amazon turtles. During this study, I used the scan sampling method every ten minutes to determine whether this species really is docile towards other animals in its surroundings. Docile behaviors were when the stingray was swimming around calmly or sitting on the concrete at the bottom. Threatened behaviors were when the stingray raised its tail or swam away quickly. The results of this study could tell us if the stingrays do not seem threatened by the creatures inside its tank. If the stingray does seem threatened, then the results could also show if the stingray is more threatened by the fish or the turtles.

1. **Peyton Jumper**

**Mentor: Karyn Collie**

*Red Wolf and Coyote Vocalizations at the Akron Zoo*

In the wild, Coyotes are highly vocal canids. They use their barks and howls to communicate with others. They are most often heard at dusk or during the night. Coyote calls are most common during breeding season because they are looking for potential mates. I conducted an observational study on the vocalization of coyotes at the Akron Zoo. To determine whether the coyotes are more likely to vocalize while the wolves next door are vocalizing or if they are more likely to vocalize alone, I monitored the vocal behaviors of the coyotes and red wolves in the Zoo. I kept track of this behavior for both species on an ethogram using the all-occurrence sampling method. The results of this study could help the zoo figure out when the coyotes are vocalizing, what is causing them to vocalize, and how often you can hear them vocalizing.

1. **Rachel Klugh**

**Mentor: Karyn Collie**

*Swaying behavior in Giant Spiny Leaf Insects in relation to height off ground and from food*

The Giant Spiny Leaf Insect, *Extatosoma tiaratum*, spends almost its entire life in eucalyptus trees. To survive in that environment, it is camouflaged to look like a leaf. One of the ways it mimics a leaf is by swaying back and forth after every step it takes, presumably to appear to be a leaf blowing in the wind. In captivity, however, they experience no wind, and still sway back and forth with each step they take. I tested to see if they elicit that behavior more as they approach a food source higher off the ground and then lessen the behavior as they travel down toward the ground. I counted the number of steps between each swaying motion and number of sways between each step. I compared this to how many inches they were off the ground and how many inches they were away from food. My results will help us further understand the swaying behavior of the Giant Spiny Leaf Insect, which is greatly under researched.

1. **Samantha Starcher**

**Mentor: Karyn Collie**

*Observing Akron Zoo’s Snow Leopard’s Behavior In Its Enclosure In Response To Its Neighboring Himalayan Tahr*

In this study, the goal was to determine how much time the Snow Leopards spent watching the Himalayan Tahr and if the Snow Leopards spent less time pacing than they spent watching the Himalayan Tahr or doing something else, such as sleeping. The behavior of Akron Zoo's Snow Leopard in its enclosure should be reflective of the activity of the Himalayan Tahr in their adjacent enclosure. I observed three key behaviors "actively watching", "stalking", and "pacing" and recorded any other activity as "other". All data were recorded as the start and stop time for each time the Snow Leopard displayed that behavior. If any individual, either the Leopard on exhibit or any of the Tahr was not visible in its enclosure, it was recorded as "Not Visible" and the time when the individual left and then returned to visibility was recorded. All data were tested for a correlation between the behavior of the Snow Leopard and the activity levels "none, calm, active, or other" of the Tahr. With the information that I gathered from this research, the Akron Zoo will be able to better understand the predator/prey relationship that the Snow leopards and the Tahr have.

1. **Sasha Hoey**

**Mentor: Karyn Collie**

*A study of the behaviors of Galapagos Tortoises exhibited in zoos compared to behaviors of tortoises documented in wild and semi-wild environments*

While we have information on the behavior of Galapagos Tortoises in the wild, what we seek to understand more is the behavior of Galapagos Tortoises in captivity. This study takes place at the Akron Zoo and observes the behaviors of two Galapagos Tortoises cared for at their facility. What I am interested in studying is foraging behavior (investigation and exploring), thermoregulatory behavior (basking), locomotor behavior (walking and climbing), maintenance behavior (resting), and social behavior (trailing, head withdrawal, and head bobbing). In order to measure these behaviors, I will be using a focal individual sampling method. My hypothesis was that my results would reflect a contrast between captive and wild behaviors, with the captive tortoises displaying many behaviors that are similar to what they would exhibit in the wild, but with slight modifications (based on activity budget studies on wild tortoises), since they are in captivity and have everything provided for them. Through this study, I hope to provide the Akron Zoo with more information on the behaviors of their Galapagos Tortoises in order to grow in knowledge of how to care for them.

1. **Victoria Seager**

**Mentor: Karyn Collie**

*Chameleon color change as an anti-predator reaction*

Color change is one of the most flexible anti-predator responses because of the little attention it brings to the prey. This study looked at the correlation between people visiting the Chameleon enclosure at the Akron Zoo and the times that the Chameleon changed color as an anti-predator reaction. In this study, scan sampling was used every three minutes. An ethogram was filled out documenting different colors that were immediately around the Chameleon during the observational period, the current color of the chameleon, and the number of people visiting the enclosure at that time. The result of this study might help the Akron Zoo with more information about their chameleons and their reactions to people visiting their enclosure.

1. **Sophia Delegato**

**Mentor: Karyn Collie**

Diodon holocanthus *response to visual stimulus and possible implications towards training and enrichment*

*Diodon holocanthus*, the longspined porcupinefish, is a fish commonly found in the zoo setting. These fish have the capacity to be trained, and they sometimes exhibit stereotypic behaviors, such as staring at their reflections. I presented them with visually attractive stimuli and monitored interest and habituation. I presented them with a triangle apparatus that contained a mirror, a red reflective square, and a red matte square and timed their interaction time with this apparatus. I compared the time it took them to explore the apparatus, which square they preferred, and when they stopped responding. These lasted 15 minutes long with instantaneous counts when they interact with the object and 15 minutes in-between each session. The results of this experiment show how quickly, if at all, these fish respond to and become habituated to stimuli in their environment. These results could be extrapolated to the need of enrichment and training in their daily care.

1. **Sophia Delegato**

**Mentor: Karyn Collie**

*The Correlation Between Crowd Size and Disturbances and the Use of Dermal Patterns in Great Pacific Octopus* Enteroctopus dofleini

The Giant Pacific Octopus is an intelligent invertebrate that can learn puzzles and faces. They have specialized skin containing chromatophores and muscular control, allowing them to change their appearance in the blink of an eye. In the zoo setting, they are often exposed to the public in ways that they cannot escape. These situations can cause stress in some organisms, leading to a poor quality of life. I monitored the octopus’s dermal appearance and number of guests at the octopus enclosure. I also mapped out her location in the tank and any occurrences of flash photography. These results show if there are correlations between the number of people and her physical appearance and position in her enclosure.

1. **Amy Gellings**

**Mentor: Karyn Collie**

*What are Malone Students’ Views on Human Origins in Comparison to National Polls and What Factors Influences Those Views?*

This thesis is researching what students at Malone believe about human origins through means of a campus wide survey, which inquires about what the participant’s stance is on evolution and the relationship between science and religion. The survey also includes several demographics questions that inquire about the participant’s religious affiliation, past education, major, and number of science and theology classes they have taken. In analyzing the survey results and conducting interviews, I am attempting to find a statistically significant relationship between the participants' answer to the question about human origins and several demographic factors.

1. **Logan Galbraith, Precious Rumano**

**Mentor: Lisa Beltz**

*Correlation of Video Game Participation and Laparoscopic Dexterity*

Our project was to construct a laparoscopic simulator using materials found around the household or easily purchased. These materials include a plastic storage container, a camping rubber bowl, duct tape and a webcam. Laparoscopic tools were purchased on ebay. Synthetic tissues were provided by Your Medical™ at no cost. The project is to examine possible correlations between video game participation and surgical dexterity among 12 Malone University students. The link between video game participation and surgical dexterity may be applied to laparoscopic training in medical programs. The first trial evaluates the participant’s ability to remove a series of beads from a set of pegs. This addresses depth perception and accuracy of manipulation. The second trial evaluates the ability to perform tasks with synthetic tissues smoothly, addressing both creative and critical thinking skills. Both trials will be quantitatively tracked using SurgTrac™ software. Time, speed, smoothness, acceleration, and handedness will be evaluated. This setup will be available for interactive audience utilization. The total cost for this simulator was approximately $75, as opposed to $350 to several thousand dollars commercially. Our simulator allows what would be an expensive piece of training equipment to be available to those parties interested in surgery at low cost.

1. **Olivia Goldinger**

**Mentor: Kate Huisinga**

*How Parental Diet of* Drosophila melanogaster *Impacts Growth Rate of Their Progeny*

A variety of environmental factors can affect the growth and development of animals. In fact, some studies have shown that the environmental conditions of parents can affect their children. The goal of this project is to determine how the parental diet of *Drosophila melanogaster* impacts growth rate of their progeny. Studies have shown that offspring with one parent (either maternal or paternal) reared on a low protein diet with the other parent on a standard diet have a faster growth rate compared to offspring with both parents on standard or both parents on low protein diets. Building on the previous studies, my study uses both a low protein diet and a high sugar diet to determine if I obtain similar growth rate results. I am also exploring whether separate strains react differently to alterations of parental diet. To achieve this, I am testing three different strains of *D. melanogaster* to examine if the different strains respond to altered parental diets similarly or not. To ensure results are due to transgenerational effects, I reared the grandparent generation on standard food. I then collected virgin females and males and mated them on either the standard, low protein, or high sugar diets to allow the parental generation to be reared on the different diets. Once these larvae reared on the different food to eclose, I will then mate these parental flies on standard food where they will lay eggs. The time it takes for these eggs to eclose will be monitored. Experimental results to date will be presented.

1. **Amber Murphy**

**Mentor: Kathryn Huisinga**

*Enzyme Kinetics Analysis of Single-Mutant and Double-Mutant vs Wild Type MDH2*

The mitochondrial malate dehydrogenase (MDH) enzyme converts malate to oxaloacetate as part of the Krebs Cycle. Clinical studies identified three male patients with severe encephalopathy who carried bi-allelic mutations in their *MDH2* gene (Ait-El-Mkadem, *The American Journal of Human Genetics*, 100:159, 2017). This study mapped the mutations to 3 different amino acids in *MDH2* and investigated the effects of these mutants *in vivo*. However, no detailed in vitro studies were performed to demonstrate that studies that these mutations directly affect the kinetics of the MDH2 enzyme. While it is likely that the mutants decrease catalytic activity of the protein, but they may not all affect the protein in the same way. To investigate these mutations further, each of the 3 amino acid changes was introduced individually into a His-tagged version of MDH2 that can be used to express a recombinant version of the protein in bacteria. The enzymatic activity of each of these mutant human MDH2 proteins as well as the wild-type will be examined to determine their Km, Vmax, and Kcat values under standard assay conditions. I will report the results of the protein purification procedure and any kinetic data generated to date.

1. **Rachel Wentworth**

**Mentor: Kathryn Huisinga**

*Transgenerational effects of a high sugar or control sugar parental diet on the metabolic state of offspring in* Drosophilamelanogaster

A variety of epidemiological studies have linked parental diet with transgenerational metabolic effects such as obesity and Type 2 diabetes. Research utilizing *Drosophila melanogaster* as a model has shown a correlation between high sugar parental diets and an altered metabolic state in progeny. Here, we compared the paternal and maternal effects of a high sugar diet on offspring. The parental generation included males and females raised separately on 9% sugar or 16% sugar diets and bred to create four different crosses. Progeny were then reared on control diets and analyzed for whole body glucose content. The results showed no significant difference in adult males or larvae, while the adult females exhibited significant differences between several of the crosses. No clear pattern was observed to isolate paternal and maternal influences. Furthermore, there was large variability among the replicates of each cross. Future analysis will seek to answer the original research question, but with notable changes in the protocol. Fly stocks will be isogenized to minimize genotype variance, and a strict schedule will be followed when breeding flies. Finally, we will employ hemolymph analysis of circulating sugars rather than quantification of whole-body glucose, as this may provide a more accurate measure of metabolic state.

1. **Marina Rarick**

**Mentor: Jaccalyn Stuckey**

*Southeastern Ohio Women's Written Correspondence and Community Associations During the American Civil War*

Studying the letters between Southeastern Ohio soldier Joseph Aplin Martin of the 97th Ohio Volunteer Infantry and his mother, friends, and other relatives reveals different styles of communication between men and women in Civil War letters and speaks to the importance of women to the Union war effort. This research seeks to determine the links between written correspondence as soldiers' roots while they were away at war, and the way women's formation of kinship networks and community associations led to a well-mobilized citizenry in the North. Southeastern Ohio is unique, with Confederate sympathizers alongside strong Unionists. Its agrarian society produced different cultural norms for women and society overall, and often its residents did not even realize the impact of their efforts in the war. Combined with a lack of women's history on the subject, the question remains: What is the relationship between the ordinary, individual, Southeastern Ohio woman’s correspondence with Union soldiers and the overall ability of women to assist the Union cause in community with one another and through associations?

1. **Matthew Noel**

**Mentor: Stephen Wirick**

*The Effects on Pitching Velocity and Lower Body Power of a Blended Aerobic and Anaerobic Exercise Program for NCAA Division 2 College Pitchers*

The purpose of this study was to determine the effects of a blended, aerobic and anaerobic conditioning program for Division 2 college baseball, varsity pitchers. The training program under consideration was in place before this study and was not changed as a method within the study. A test to determine lower body power, using the lateral bounds test, cardiovascular fitness using the Bruce walking protocol, and maximum pitch velocity were recorded before the program began. The conditioning program was followed for 12 weeks by seven participants. The same tests were then done again on the participants after the 12 week period. There was no significant change in any of the tests of lower body power, cardiovascular fitness, or maximum pitch velocity. As a result, a combined program of aerobic and anaerobic conditioning for college baseball pitchers is not recommended.

1. **Cassandra Loskocinski**

**Mentor: Lauren Seifert**

*A College Student's Guide to Relaxation*

The research study I created was conducted to find out what helps college student best relax when they are experiencing stress on a day to day basis. The study was composed of two groups, Group A, serving as a control group and group B as the experimental group. Each subject participated in an individual 20-25 minute session, where they took a pretest to measure where their stress levels were at, followed by 15 minutes alone of relaxation time. Participants in both groups turned their phones off for the entire session and either left them with me or in the front of the room. Participants in group A were allowed to relax, without materials, and could choose to meditate, or do whatever they left like doing to relax, while group B could either choose to draw or write something using the materials provided. Once the 15 minutes were up, I came back into the room and gave them a post test set of debriefing questions to measure their stress levels after their 15 minutes of relaxation. The differences found in mood and relaxation will be discussed in my results.

1. **Emily Becks, Kiah Powell, Katelyn McWhirter**

**Mentor: Lauren Seifert**

*Emotions Connected To Influential Autobiographical Memories*

The goal of our study was to better understand the relationship between emotions and autobiographical memories. Extant research indicates that people with Major Depressive Disorder (MDD) recall more negative memories than positive compared to persons without MDD. To further explore this, we conducted an anonymous, semi-structured memory recall survey for college students. Participants were a convenience sample from among an introductory communications class and a senior-level (general education) capstone seminar. A step-wise loading of predictor variables related to depression, having a history of injury, and having a history of concussion significantly predicted 8.2% of the variance in the overall emotional valence of participants' recalled autobiographical memories. Contrary to our hypothesis, participants were more likely to report positive valence memories than negative ones. Limitations of the study are convenience sampling and demand characteristics associated with recalling emotional memories.

1. **Taylor Bernard, Lauren Cantor, Mayah Jones**

**Mentor: Lauren Seifert**

*Pets vs. Emotional Support Animals: Do they Have the Same Impact?*

Ein, Li, and Vickers (2018) found that Emotional Support Animals (ESAs) reduce the heart rate and subjective measures of stress of their owners. We followed up on this. Our team studied persons with ESAs and persons with ordinary pets. We desired to know if pets are able to decrease subjective measures of stress like ESAs did in Ein et al.’s study. We contacted all undergraduates at Malone University via a campus wide email. Interested individuals with a pet or an ESA contacted our supervisor to inquire about taking part. We asked participants to fill out a journal for five days in order to track their time with their animals and their emotions. Then, we met with each participant for an interview. By analyzing trends in recreation time with animals and daily happiness, we determined that pet and ESA owners appear to be equally content.

1. **Kailee Perkins, Nicole Albert, Sharon Muriuki, Sarah Weisent**

**Mentor: Stephanie Burgess**

*Exercise in Adolescents: BMI’s Relation to Physical Activity*

Exercise in adolescents is important in maintaining a lower body mass index (BMI) which is vital to prevent overweight related health issues. The purpose of this study is to examine a relationship between the amount of exercise and its effect on BMI in high school adolescents by using a descriptive correlational design. This study involved two-hundred and fifty-three high school students ranging in ages from 14 to 19 from two Northeast Ohio schools, one rural and one small city. The differences between schools is also being examined. The mean age of students at the rural school was 15 and an average BMI of 24.9. The mean age of students at the small city school was 15.5 and an average BMI of 25.5. Surveys included questions on daily amounts of physical activity and hours of inactivity. The analysis of this data is in progress at this time.

1. **Christina Neumann, Taylor Lauer, Aerial Jernagin, Nazae Williams**

**Mentor: Stephanie Burgess**

*Effects of Smoking and Vaping in Adolescents*

The purpose of this research study is to see if there is a common trend of increased vaping or smoking incidences among adolescents who report feeling down or hopeless. The survey was conducted at two Northeast Ohio high schools. One rural and the other a small city school. There were 246 students who participated aged fourteen to eighteen. The researchers are investigating multiple variables including gender, smoking, vaping, and ages of experimenting with nicotine products. Also the negative feelings they might have regarding involvement in activities or feeling down about themselves or life. As nursing students, understanding this population who vape or smoke can help the nurses of the future prevent these adolescents from engaging in this activity.

1. **Aubriana Ressler, Corbin Schrock, Kristen Norcia, Faith Freeman**

**Mentor: Stephanie Burgess**

*Do Adolescent Food Choices Alter BMI and Exercise levels?*

The researchers explored the pattern of health and food choices adolescents make, and how those choices affect their health. The purpose of this study is to examine the relationship between food choices and physical activity with body mass index (BMI) in adolescents. A descriptive correlational design was used to analyze voluntary, self-report surveys completed by high school students in a rural school district and a small city school district in Northeast Ohio. There were 246 surveys completed between the two schools. Of the 45 questions on the survey, 16 were used towards our study. The mean age of the participants was 15 years old. Our results indicated that the correlation of BMI and days a week eating breakfast had a moderate inverse relationship (-0.33). The T-test between Tusky Valley and Dover using the correlation results between BMI and days a week eating breakfast was not statistically significant (0.22). The ANOVA test produced a F-value of 36.98 for Dover and 31.31 for Tusky Valley. This shows that there is a large amount of variance in the results.

1. **Rachael Goddard, Allison Thomas, Alexandria Boughton, Courtney Looney**

**Mentor: Stephanie Burgess**

*Beverage Choices and Adolescent BMI*

Our research seeks to discover the relationship between adolescents' caffeine and sugar consumption and their weight and other health conditions. A descriptive correlational study design was used to collect and interpret data. This study draws on 245 random surveys of ninth through twelfth grade students from two Northeast Ohio high schools in both rural and urban environments. The surveys were voluntary, self-reported, and administered with appropriate parental consent. Data was collected in the classroom during regular class times. Survey questions collected data relating to adolescents intake of sugar sweetened beverages (SSBs), caffeine, fruits and vegetables as well as BMI, average hours of sleep, concentration levels, energy, and mood levels. Student’s BMIs were calculated by collecting actual heights and weights, then adjusted for the adolescent growth chart, Our research was guided by Nola Pender’s Health Promotion Model. A positive correlation was found between overweight and obese BMIs and fruit juice consumption.

1. **Chase Good, Logan Studer, Emily Sweitzer, Benjamin Peterson**

**Mentor: Stephanie Burgess**

*Adolescent Sleep Quality and Technology Use*

Sleep quality is important for performance, cognition, and mental health among adolescents. Our study aims to determine the correlation between technology use and sleep quality in adolescents 14 to 19 years of age. The sample group consisted of 253 adolescents between two high schools in Tuscarawas County, Ohio. The data was collected using an in-class questionnaire that included personal demographics, Body Mass Index (BMI), hours of sleep per night, and hours of technology use per day. The independent variable is hours of technology use and the dependent variable is hours of sleep. This study was conducted with descriptive, correlational research design, and a correlation coefficient among variables. Results showed no statistically significant correlation between hours of technology use and hours of sleep.

1. **McKayla Eberhardt, Blake Cary, Katelynne Ball, Emily Schafer**

**Mentor: Stephanie Burgess**

*Body Image in Adolescence: What factors influence body image perception?*

Body image perception is a growing concern in adolescence for those who deal with increasing pressures from society and peers. Study participants were from two Ohio high schools in Tuscarawas county (one rural and one small city school). There were 252 high school students that had the opportunity to participate in an anonymous health survey distributed during the students’ classes. The study was aimed at exploring how negative body image perception correlated with BMI, gender, hours spent watching television, worrying about what others think, and involvement in sports teams. Consent was obtained from both the principal, teachers, parents and students prior to data collection. A descriptive correlational design was used to collect data. Our findings showed a strong positive correlation (r = 0.6726) between body image perception and BMI. We found that the more overweight or underweight an adolescent is, the more likely it will be for an adolescent to have a negative self body image, and the majority of students did not have an accurate depiction of their body weight. Our study also showed that females have a higher (heavier) body image perception compared to males. Implications for nursing practice is the need for nurses to educate adolescents on healthy habits and body weight.

1. **Brylee Jones, Auguste Mills, Alex Dutton**

**Mentor: Karen Slovak**

*Gun Violence in Schools: Impact of a Short Training*

Gun violence has become a very prominent issue in today’s society. Over the years, gun violence has invaded uncharted territories such as movie theaters, churches, banks, and households. Now it has begun to affect our youth in what is supposed to be the place that prepares them for their future, and at an alarming rate. Through our research we have identified the severity of gun violence in schools, issues that potentially cause people to commit gun violence, effects of such violence, prevention methods, and community resources. Gun violence has left such an impact on children, families, educators, and community members that it is time to make a change in order to protect our children.

**Symposium Planning Committee**

Kathryn Huisinga, Co-Chair

Steve Jensen, Co-Chair

Lisa Beltz

Stephanie Burgess

Linda Hamilton

*Special Thanks to*

David King, President

D. Nathan Phinney, Provost

AVI Fresh

Aultman Health Foundation

Malone University Honors Program

Malone Physical Plant Staff

College of Theology, Arts, and Sciences