16th Annual
Malone University

Student

RESEARCH SYMPOSIUM

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THE MALONE UNIVERSITY STUDENT RESEARCH SYMPOSIUM

showcases student scholarship across schools and departments. Please, join us in congratulating student participants and their faculty mentors as we come together in community to honor graduate and undergraduate research and creativity.

1. AIDAN CALDERHEAD

Mentor: Kyle Calderhead

A Sequential Three-Stage Binary Integer Linear Programming Approach to the University Course Timetabling Problem at Malone University

Timetabling problems are crucial in educational settings, requiring optimal assignment of resources within given constraints. This research proposal introduces a novel three-stage binary integer linear programming approach to address timetabling challenges specific to Malone University. By assigning instructors, timeslots, and classrooms to courses, this approach aims to optimize operational workflow and improve decision support for course timetabling. Utilizing real data from Malone University's Department of Natural Sciences for the Fall 2024 semester, the proposed model offers efficient and effective automation, promising significant enhancements in timetabling efficiency and operational effectiveness.

2. JONATHAN SCHONDEL

Mentor: Sheri Hartman

Effectiveness of Implementing a Standardized Debrief Tool

Background: Nursing simulation lab is an ever-growing facet of nursing education. With any educational experience, it is important to assess if the students were able to complete the learning objectives. The method that is used for this is a debrief following the simulation. The purpose of this evidence-based project is to find the most accurate and appropriate debriefing tool for students at Malone University. Method: This evidence-based practice project involved assessing and comparing a standardized debriefing tool to the current debriefing tool used. Fifteen 3rd year nursing students and their two clinical instructors completed a simulation lab. Following the simulation, the clinical instructors lead the students through a debrief using the PEARLS standardized debrief tool. Findings: The findings suggest support from the clinical instructors to use the standardized debrief tool as they felt that it improved the overall quality and consistency of the debrief. Conclusion: The medical and educational worlds are ever-changing and new challenges arise. Using a tool that is based in consistency and accuracy allows constant oversight into student learning outcomes.

3. ALLISON THOMAS

Mentor: Sheri Hartman

QI Project: Guidelines to Decrease Hospital Readmission Rates

Background: In January 2023, the Centers for Medicare and Medicaid services (CMS) began to implement a quality rating through Healthcare Effectiveness Data and Information Set (HEDIS) measure for healthcare organizations to decrease their emergency department (ED) readmissions. CMS states that patients seen in the ED must have a telephone call or visit with their provider within seven days of hospital discharge. This telephone call must be completed by a nurse with an Associate's degree (ADN) or higher. Due to this, a policy was put in place that RN care managers must call all patients after an ED visit. The purpose of this quality improvement project was to promote buy in of this policy change by discussing the evidence regarding readmission rates dependent upon the education preparation of the case manager performing the follow-up calls. Method: This education session was presented in person to a total of 16 participants, 11 RN care managers, two social workers, one health coach and two directors. Participants were asked to complete an evaluation tool immediately following the education session. Results: The data findings suggested that all 16 participants (100%) who completed the evaluation tool thought their experience with this education session was effective and that the materials presented met the stated objectives. However, only three participants are currently following policy. Conclusion: Through education and reinforcement of the policy, participants understood the importance and why this policy was enacted. Outcomes should be assessed at three, six, nine, and 12 months for follow up on whether or not the policy is being followed and enforced.

4. BETHANY MOLNAR

Mentor: Sheri Hartman

Coping Exercises to Improve the Mental Health of Nurses

Nurses are responsible for the well-being of their patients, which can often lead to feelings of stress, anxiety, and depression among nurses. The COVID-19 pandemic exacerbated these symptoms. Effective coping mechanisms can help manage and reduce the occurrence of mental health symptoms. The purpose of this EBP project was to determine the most effective coping mechanisms and educate nurses about strategies to reduce anxiety, depression, and stress. A 45-minute presentation about effective coping strategies was conducted for 19 recent nursing graduates of Malone University and two nurse members of Sigma Theta Tau, Pi Chi chapter. Participants engaged in a guided imagery session and were provided journaling prompts. All 21 participants completed an evaluation tool immediately following the education session. Results demonstrated that 66.7% (n=14) of participants reported feelings of stress and had difficulty relaxing. Eleven participants (52.4%) reported feeling anxious at work and nine participants (42.8%) reported difficulty falling asleep. Participants described current coping strategies as socializing, sports, walking, cleaning, watching TV, and prayer/church. After the presentation, participants reported they planned to implement journaling, self-reflection, and guided imagery to their coping strategy list. Therefore, this project demonstrated that an education session can increase knowledge of coping strategies, which may have the potential to decrease stress, anxiety, and depression among nurses.

5. MADDIE FISHER, ASHLEY MILLER, JILLIAN VICKNAIR

Mentor: Holly Kreis

Supporting Transition from Pediatric to Adult Sickle Cell Care Through Nursing Use of a Self-Management Assessment Tool

Although medical advances have lengthened life expectancy and reduced mortality in childhood for the estimated 138,000 Americans with sickle cell disease (SCD), amongst adolescents and young adults (AYAs), morbidity and mortality (M&M) have increased. At the root of this crisis lie the challenges of transitioning to independent disease self-management and adult healthcare. In response, transition programs shown to feasibly, effectively reduce M&M-provoking gaps in AYA SCD management have emerged. However, participation in such programs is limited, and AYAs with SCD remain vulnerable. The aim of this proposed study is to determine if regular nursing application of an age- and disease-specific self-management assessment tool promotes accurate identification of adolescent sickle cell patients' (ASCPs) educational and psychosocial needs and prompts pertinent, timely interventions to enhance transition readiness and disease self-management. This mixed-methods study would compare self-management support provided by nurses caring for ASCPs before and after the tool's implementation. Post-intervention surveys would explore participants' perceptions, particularly seeking to determine whether communication, education, and referrals became better tailored to individual patient needs. Anticipated findings include greater insight into the unique knowledge, skills, and attitudes of ASCPs; increased pertinence and frequency of supportive nursing interventions; and improved quality of life for AYAs with SCD.

6. KINSEY KNOCH, BRADEN KNOCH, JACE WARD

Mentor: Holly Kreis

The Importance of Medication Adherence in the Adolescent Transplant Population

An issue in adolescent organ transplantation is barriers associated with medication adherence. Without consistent antirejection medications, organ rejection can occur. The issue persists because little is known about adolescent transplant populations and what causes medication nonadherence within this population. The purpose of this study is to identify challenges that impact medication adherence for adolescent populations and find ways to identify those at risk for nonadherence. The study used a survey to identify adolescents and caregivers at risk for medication nonadherence. Using a screening tool before an adolescent receives an organ transplantation and begins a lifelong medication regimen can assist healthcare providers in identifying early markers for potential medication nonadherence, and prompt interventions to address these concerns. Key findings would include identifying the most common barriers to medication nonadherence in adolescents from the possibilities of the lack of understanding of the importance of their medications, forgetfulness and distraction when needing to take their medication, fears of standing out amongst their peers, and potential for unpleasant side effects related to their medications. With the knowledge of these barriers, medical staff could then provide education and resources to help adolescents and caregivers overcome the barriers to improve medication adherence.

7. RACHAEL TROYER, PAYTON BEECH, CLAIRE SULLIVAN

Mentor: Holly Kreis

Exploring Nursing Interventions and Effects on Multiple Sclerosis Patients

One of the most pressing issues in the lives of Multiple Sclerosis (MS) patients is the debilitating pain and loss of everyday function. This issue persists because nurse-led exercises are under-researched and under-utilized in improving the quality of life for MS patients. The purpose of this study was to evaluate the outcomes of passive range of motion exercises and fine motor exercises like progressive muscle relaxation (PMR) and Benson relaxation technique (BRT) as well as guided imagery, music therapy, and massage therapy. The study was conducted using the verbal numeric pain scale that rates the patient's level of pain on a scale of zero to ten and an adapted functional status questionnaire that rates the patient's level of independence on a scale of zero to three. Both of these scales are conducted pre-intervention and post-intervention. Our study demonstrates that a nurse-led intervention bundle will increase MS patients' QoL as measured by a decrease in pain and an increase in levels of independence. Evidence showed that interventions need to be tailored to each patient's pain and level of independence ratings. More research needs to be conducted to develop an MS nursing intervention bundle that is adaptable to each patient's disease progression.

8. MATT DILE, ABIGAIL LAMMERS, REED MILLER

Mentor: Holly Kreis

Cancer Caregivers & Mental Health

One of the most pressing issues in the field of cancer patient care is the caregiver role strain. The issue is problematic because it harms the mental health of informal caregivers and it hinders the quality of care they provide. The issue persists because caregiver role strain is a neglected aspect of cancer patient care. The purpose of this study is to identify depression, anxiety, and other symptoms of caregiver role strain in informal caregivers of cancer patients. The study will utilize a survey to determine varying levels of caregiver role strain by recruiting informal caregivers from inpatient oncology hospital units. With the use of an effective assessment tool, the detrimental effects on caregivers of cancer patients will be identified. Key findings would include a clearer insight into the manifestations of caregiver role strain for informal cancer caregivers. Both the prevalence of mental health issues among caregivers and the far-reaching effects on cancer patients will be better understood after this study. These findings indicate that more must be done to help cancer patients and their caregivers. Further research must be conducted to develop interventions for managing the effects of caregiver role strain.

9. BRANDI KNIGHT, RICHARD FORGACH, DYLAN KAUFMAN

Mentor: Holly Kreis

How will the BDR Journal affect Rehospitalizations in Patients who are Suffering from Congestive Heart Failure?

Congestive Heart Failure exacerbations are the greatest cause of patient rehospitalization in the US. Rehospitalization for CHF patients frequently occurs because treatment focuses on exacerbations, not prevention. Education is key to preventing rehospitalization; it provides patients the opportunity to create positive changes in their lives. Currently, the lack of education does not allow patients to focus on managing modifiable risk factors. The BDR Journal is proposed to pinpoint gaps in patients' health management; these gaps allow education on interventions, ultimately preventing rehospitalization. The BDR Journal can be utilized as a tool to monitor and encourage compliance in treatment by asking patients to record different daily activities, daily weights, intake and output, calorie/sodium intake, medication adherence, and daily exercise. The pilot study will be conducted using screening tools, assessing patients' understanding and compliance with interventions. Participants would then utilize the journal to monitor the interventions implemented, while also gaining feedback from healthcare providers at follow-up appointments. Using the BDR Journal should reduce the risk of rehospitalization in patients with CHF through encouraging adherence to daily interventions that promote healthier management of this chronic condition.

10. ELISCHAMMA SOIT GUERSCHOM BELADE ABEL

Mentor: Kathryn Huisinga

Exploring the Effects of Substituting Arginine 248 with Phenylalanine in Human Cytoplasmic Malate Dehydrogenase

Malate dehydrogenase (MDH) is a highly conserved enzyme found in two distinct forms in the human body: cytoplasmic(MDH1) and mitochondrial(MDH2). Both forms catalyze the interconversion of malate to oxaloacetate with the concomitant reduction of NAD+ to NADH. MDH2 primarily functions in the Krebs cycle, and MDH1 is involved in the malate-aspartate shuttle. Recent studies have linked both forms of MDH to various cancers and early onset encephalopathy in children, prompting efforts to understand how they modulate metabolic intermediates and how their activity can be regulated, particularly in disease contexts. This study generated a mutation in MDH1, where an arginine amino acid at site 249 is replaced with phenylalanine. This mutation mimics arginine methylation and has the potential to regulate the enzyme's activity in vivo. The substitution of arginine, a positively charged amino acid, with phenylalanine, a bulky and hydrophobic residue, disrupts dimerization which is critical for MDH activity.. Purification of the Arg249Phe mutant expressed in E. coli, shows this mutation reduces MDH solubility compared to the wild-type protein, causing it to aggregate into inclusion bodies. This newfound insight highlights the need for further exploration into inclusion bodies and strategies to solubilize this MDH mutant for comprehensive study. Enhanced understanding of MDH holds promise for the development of novel medications and treatments targeting diseases associated with MDH dysfunction.

11. ELISCHAMMA ABEL, JULIEA DWORNING, RANDY HARRIS, MATT TROPH

Mentor: Kathryn Huisinga

Site Directed Mutagenesis of hMDH1 (D61S)

Malate dehydrogenase (MDH) is a crucial enzyme facilitating the conversion of OAA and malate, using NADH as a cofactor. Two distinct variants of MDH exist: mitochondrial MDH, or MDH2, and cytosolic MDH, or MDH1, each localized within their respective cellular compartments. MDH1, the variation studied here, participates in the malate-oxaloacetate shuttle, converting malate to oxaloacetate in the cytoplasm. Mutations in both forms of MDH have been associated with various diseases, prompting intensified research efforts. These mutations, often arising from substitutions of critical amino acids, alter the enzyme's function and activity. We engineered a mutation, replacing the 61st amino acid, aspartic acid (acidic), with serine (polar) to assess the importance of chemical properties within the active site. We hypothesize that, by changing this amino acid, the enzyme will be less efficient. We will present data on the generation and purification of a D61A mutant hMDH1 protein along with investigations into this mutant's ability to catalyze the oxidation of malate to OAA.

12. JULIEA DWORNING

Mentor: Steven Lane

The Immunological Consequences of Social Isolation in Pogonomyrmex Barbatus

Sociality plays a pivotal role in the animal kingdom, particularly in eusocial societies such as ants. Disruption of sociality through social isolation often leads to negative consequences, including premature death, in studied ant species. Previous studies have focused on genetic and behavioral effects of social isolation, but how social isolation impacts immune function has not been studied. To investigate this, both solitary ants and those maintained in groups of ten (of the Pogonomyrmex barbatus species) were injected with Escherichia coli following one week of isolation. Primary analysis via cell count on a hemocytometer revealed that completely isolated individuals had a higher concentration of E. coli cells when compared to those in a group of ten. These findings carry significant implications for comprehending ant colony dynamics and shed light on the broader implications of social isolation across the animal kingdom.

13. MOLLY BULLION, JENNIFER VICKNAIR, KENDALL ANENSON, RACHEL STRANGER

Mentor: Kathryn Huisinga

Effects of MDH1 Mutation on Enzymatic Activity

Cells generate ATP by oxidizing carbon sources obtained in the diet, creating the energy required for continuing its vital processes. The transformation of intermediates across the mitochondrial membrane is an important part of the metabolic process. The enzyme malate dehydrogenase 1 (MDH1) greatly contributes to this process by working in the cytoplasm to convert OAA and malate. We are interested in the ways that various mutations on amino acid 61 of MDH1, which is an aspartic acid (Asp), impact the overall function of the enzyme and its interactions with other metabolic enzymes in particular, phosphoenolpyruvate carboxykinase (PEPCK). We have generated a mutant version of the MDH1 protein where Asp61 is mutated to glutamic acid, which is similar in the functional group but with an additional methyl group. We hypothesized that there would be little functional activity change within the enzyme, but due to the nature of the location of the change, it may change interactions between enzymes. We will present results from the purification of the mutant protein from E. coli and activity assays to evaluate the enzymatic activity.

15. HUNTER SWARTZ

Mentor: Chelsea Weyand, Eva Szigethy, Miraides Brown

The Impact of Residing in an At-Risk Community on Accessing Behavioral Health Treatment in a Coordinated Care Model

Youth living in poverty are at increased risk for behavioral health (BH) concerns and have difficulty accessing high-quality treatments. This study uses the Childhood Opportunity Index (COI) to identify patients who reside in at-risk communities who have been referred for BH services by their pediatric primary care provider (PCP) in a system that coordinates care between PCP and BH providers. We hypothesize that individuals who reside in an area that places them at risk for adverse health outcomes will be less likely to engage in BH treatment once a referral is made in a system that does not include integrated BH services.

16. SIERRA TKACIK

Mentor: Lauren Seifert

Narrative Preference; Why I?

Fiction reading is a common pastime (Beach, 2023), but what are the preferences of readers in regard to perspective? What influences a preference for either first- or third-person narrators? My anonymous survey aimed to study this question among readers of Malone University with various questions about reader preference and analyzing the data I gathered using inductive analysis. If there are similarities, then learning them will make for an excellent resource when considering what perspective to use when writing fiction.

17. EMMARAE FOY

Mentor: Lauren Seifert

How Perfectionistic is the Malone University Population?

I am currently very interested in perfectionism and how it affects people in a variety of ways. This is a short report of my research, conducted on the Malone University population (students- both graduate and undergraduate, and faculty members), as well as an analysis of different factors that may have contributed to each participant's results. Therefore, throughout this project, I will be outlining my findings as well as some correlations within these results to learn more about the different components of perfectionism that I initially observed in a previous study entitled Dimensions of Perfectionism (Frost et. al).

18. JOELLE MORGAN

Mentor: Lauren Seifert

A Study on Music Interventions Effect on Mood

With the help of Dr. Lauren Seifert, my Individual Research Project in PSYC 274 examined the effects of a music intervention on the moods of older adults. Since living in a long-term care facility or nursing home can be mentally taxing, I wondered if music could potentially ease some of that burden. This quasi-experimental descriptive study took place in northeast Ohio. Participants were administered a pre- and post-survey regarding their personal feelings–such as happiness, self-esteem, and energy level–before and after the music activity. Although the sample size was small, the results proved that simply one music-listening session was not impactful enough to change someone's mood. These results are important as the participants had good things to say about the music, but since it was only a brief session, the music did not have as powerful of an impact. This is consistent with the small sample size and research on everyday music suggesting that it is less impactful than one might think–especially when listeners are at saturation (i.e.. have plenty of opportunities throughout the day to listen to self-selected music).

19. PSYC CLUB

How to Study for Final Exams: Some Advice from Psychology Club

Social Media (SM) and your phone aren't going to stop in order for you to study for final exams, but you can "go away" from them while you study. Did you know that the average person cannot handle more than about 4 pieces of raw, unchunked information at a time? So, given this it is actually predictable to be overwhelmed in a world where your classes are demanding and SM never stops. In this poster, we'll give you some advice about how to best make use of your

study time before final exams. Our tips include: putting your phone on silent and turning off social media notifications on your laptop/computer, scheduling your study time, taking breaks, and making sure that you get enough sleep, exercise, and nourishment. Does this sound too good to be true? With a little bit of planning, you can optimize your study time and performance.

Keywords: studying, spaced retrieval, SM breaks