Spring 5-25-2024

A Multimodal Approach: Implementing OMM for Spinal Surgery Patients' Pain and Anxiety

Summer Barnes
University of San Diego, summerbarnes@sandiego.edu

A Multi-Modal Approach: Implementing OMM for Spinal Surgery Patients' Pain & Anxiety

UNIVERSITY OF SAN DIEGO
Hahn School of Nursing and Health Science
Beyster Institute of Nursing

DOCTOR OF NURSING PRACTICE PORTFOLIO

By

Summer Trinity Barnes

A portfolio presented to the

FACULTY OF THE HAHN SCHOOL OF NURSING AND HEALTH SCIENCE
UNIVERSITY OF SAN DIEGO

In fulfillment of the requirements for the degree

DOCTOR OF NURSING PRACTICE
May 1, 2024

Table of Contents

List of Figures

Documentation of Mastery of DNP Program Outcomes

A Multi-Modal Approach: Implementing OMM for Spinal Surgery Patients' Pain & Anxiety

Summer Barnes BSN, RN

Melissa Garth, MSN, ACNP, CCRN

Dr. Joseph Burkard, DNSc, CRNA, AACN

University of San Diego

Abstract

Introduction: The purpose of this evidence-based practice Doctor of Nursing Practice (DNP) project was to encourage thorough assessment of pain and anxiety prior to spinal surgery in order to identify the need for implementation of additional modalities, such as osteopathic interventions for pain and anxiety management. It is pertinent that as holistic providers we address this populations often missed psychological distress and ineffective pharmacological pain regimens to promote better patient outcomes.

Background: Research says there are approximately 1.62 million instrumented spinal procedures performed annually in the United States. Spinal surgery is not uncommon, and neither is the chronic pain and anxiety it is associated with. Osteopathic manipulative medicine (OMM) has been found effective and is commonly used as a non-pharmacological, alternative modality used for pain. Chronic pain is also often associated with anxiety and depression. It has been shown that OMM may help reduce anxiety and psychological distress in those experiencing pain due to musculoskeletal disorders.

Methods: Assess anxiety (Hospital Anxiety and Depression Scale/HADS) and pain (Visual Analog Scale/VAS) using valid standardized tools preoperatively and postoperatively of agreeable spinal surgery patients. An OMM consult was placed immediately postoperative and continued throughout hospitalization for appropriate and agreeable patients. Osteopathic interventions will be determined by the osteopathic provider at consultation. These interventions will be implemented in addition to our standard care including current multi-modal pharmacological regimens as needed. Results were measured by the number of OMM consults, as well as, pain and anxiety immediately after OMM and around the time of discharge.

Results: There were a total of 20 spinal surgery patients assessed preoperatively, 13 of those patients participated fully in this project, 7 refused OMM. From the 13 patients, we have seen an improvement in pain, anxiety and depression. Out of 13 patients that underwent OMM, 100% verbalized that intervention improved pain and anxiety immediately after intervention. Using the standardized tools: pain was improved by 43%, anxiety improved by 38%, and depression improved by 32% around time of discharge. The amount of OMM consults increased by 18% over a 4 month time frame prior to implementation of the project and during. Length of stay was unable to be determined due to the high complexity of these patients' surgeries and hospital stays complicated by their multiple comorbidities, therefore was excluded from results as a reliable depiction of intervention effectiveness in this study.

Evaluation: While this is a small study, based on the results there shows great promise that considering ordering OMM early in this population can benefit their recovery postoperatively by decreasing pain and anxiety/depression. Incidentally, we were able to introduce and educate patients of alternative modalities for pain, anxiety/depression management. There were barriers including language barriers and translation of anxiety assessment tools and refusal of alternative medicine. Additional implementation into practice over longer periods of time is needed to expand results and determine true effectiveness of incorporating OMM for our spinal surgery patients.

Background and Significance

Research says there are approximately 1.62 million instrumented spinal procedures performed annually in the United States. Spinal surgery is not uncommon, and neither is the chronic pain and anxiety in which it is associated with. Musculoskeletal complaints are some of the most common complaints that patients have. Many have to resort to surgical intervention for hope of increase in mobility, decrease in disability and relief of pain. Prior to surgical intervention these patients' have their pain managed with multi-modal pain regimens, most including opioid use. Due to this population's extensive use of pharmacological interventions for symptom relief these patients' pain can be very difficult to manage. Along with major surgery such as spinal surgery, comes the exacerbation of anxiety. Spinal surgery and admission into the hospital are stressful experiences that can cause psychological distress for patients. In one study of 45,000 patients there was found to be "an association between a history of anxiety and depression and negative outcome after lumbar spine surgery" (Deshpande et. al, 2024). While these psychological conditions can gravely affect the outcomes of our patients postoperatively, we do not currently implement standardized assessment prior to surgery for more effective management during their hospital stay. It is important to introduce additional modalities to holistically treat factors such as pain, anxiety and depression of these patients to promote better patient outcomes overall.

Osteopathic medicine has a more holistic approach with "mind-body-spirit" as the basis of treatment. Osteopathic manipulative medicine (OMM) has been found effective and is commonly used as a non-pharmacological, alternative modality used for pain. Chronic pain is also often associated with anxiety and depression. It has also been shown that OMM may help reduce anxiety and psychological distress in those experiencing pain due to musculoskeletal

disorders. “Advantages of OMM administered postoperatively include easy implementation and cost-effectiveness in terms of shortened hospital stays resulting from effective relief of acute pain. Additionally, relief of pain leads to decreased postoperative morbidity and mortality and increased patient satisfaction” (Nicholas & Oleski, 2002). OMM does not only aid in pain relief, but has also shown indirect decrease in anxiety and depression due to its somatic dysfunction targeting. “The reduction in muscular tension through the use of OMT may reciprocally reduce emotional stress by shifting the balance of sympathetic and parasympathetic systems to a more parasympathetic/relaxed state and could therefore benefit the mental health of those who are dealing with stress, anxiety, and depression” (Abraham et. al, 2021).

Purpose

The purpose of this evidence-based project is to encourage thorough assessment of pain and anxiety prior to spinal surgery. In order to properly manage these population symptoms postoperatively an assessment of their pain and anxiety is pertinent since each patient is different and has varying history. This will help lead to a more well-rounded plan of care with patients that have chronic pain, anxiety and opioid or benzodiazepine use. By proactively assessing these risk factors we can identify differing needs patient-to-patient. Addressing these populations often missed psychological distress and ineffective pharmacological pain/anxiety regimens to promote better patient outcomes. As advanced practice providers we can help to cover these gaps of assessment and education of available alternative modalities such as osteopathic medicine.

Evidence-Based Practice Model

There are several effective and useful evidence-based models that could be the framework for this project, although the one that was selected was the Johns Hopkins Nursing Evidence-Based Practice Model (JHNEBP). This model is divided into three easy-to-follow steps

including: practice question, evidence and translation (Brunt & Morris, 2023). Within the first phase the PICO question is developed based on the inquiry from the environment of implementation and reflection. The second phase comprises a literature review and research to find supporting data for the practice question. In the last phase, there is a synthesized recommendation for implementation that can be recommended for practice. This tool aims to identify best practices & incorporate them into everyday practice with constant quality improvement through a cyclical process. This framework is meant for the working nurse and excels when used in collaboration with interprofessional teams. This is why JHNEBP works seamlessly with this specific project as it can be used in a hospital setting where collaboration between interprofessional teams is necessary. For this project to succeed if recreated it is important to ensure collaboration between the team throughout the patient's hospitalization is maintained as this will lead to better patient outcomes.

Literature Review/Evidence for the Problem

During my literature review for this project I have found that there is an apparent gap in identifying and mitigating anxiety and pain, their relationship to one another, and spinal surgery. It is known that pain and anxiety are very common within this population, in fact any of those with a musculoskeletal condition. In a systematic integrative review covering anxiety and depression in spine surgery, symptoms of preoperative anxiety and depression occur in approximately one-third of patients with chronic back pain undergoing surgery. Preoperative anxiety and depression are important outcome predictors of greater pain and physical impairments, and lower health-related quality of life in patients undergoing spine surgery (Strom et. al, 2018). Therefore, it is imperative that we as advanced care providers help to identify these risk factors to maximize plan of care and ultimately improve successful outcomes.

In order to address these symptoms while in the hospital and beyond there should be proper, timely assessment completed. "…only 10 percent of orthopaedic surgeons and neurosurgeons follow recommended use of psychological screenings prior to surgery" (Johns Hopkins, 2014). Within the hospital system that this project was implemented there is no current standard for assessment of pain and anxiety preoperatively. This project will deviate from standard care by completion of screening tools to identify patients most at risk for increased pain and anxiety after spinal surgery. There is currently no standardized method to assess the severity or history of these patients' pain or anxiety. "It is estimated that between 25% and 80% of patients admitted to hospital for surgery experience preoperative anxiety and anxiety can negatively influence patient recovery" (Stamenkovic et. al, 2018). Many of these patients' pain and anxiety will be overlooked and only "common" pain and anxiety management will be included in their plan of care, when care should be individualized to each patient for better outcomes and to prevent delay of incorporating alternative modalities into practice. Since screening is not currently part of standard care, integrating these tools can benefit the patient by highlighting further needs to the provider so that they are identified proactively in the preoperative stage and addressed appropriately postoperatively. In doing so, we will optimize our patients' outcomes by decreasing their pain and anxiety, improving patient satisfaction with hope of decreasing opioid and benzodiazepine use. It is important to note if the patient assessed has a history of chronic opioid use to determine if their pain management postoperatively will be more difficult. "Furthermore, preoperative opioid use prior to spine surgery has been reported to range from 20% to over 70%, with nearly 20% of this population being opioid dependent" (Ketan et. al, 2020). In a narrative review about management of postoperative pain in patients following spine surgery, it is highlighted that it is a confronting challenge with spinal surgery patients due

to their increased incidence of both chronic pain conditions and postsurgical pain. It goes on further to say that peri-operative planning is important to addressing this populations' pain. Including multimodal treatment have proved efficacious in the immediate postoperative period (Nitin et. al, 2022). This being the very aim for this project in expanding our multimodal approach for a more successful plan of care. There is evidence that there is an urgent and unmet need to find and apply extensive perioperative solutions to combat opioid use, particularly in patients undergoing spinal surgery (Yerneni et. al, 2020). A meta-analysis of the rehabilitation-related effects on fear, pain and disability of patients that have undergone lumbar fusion surgery discusses the significant positive effects that a comprehensive multimodal approach had a decrease in disability, decrease in pain and pain-related fear. Osteopathic manipulative therapy being an intervention showcased in this. In another meta-analysis, immediate implementation of multimodal rehab second this statement of improvement in pain-related fear and reducing disability (Bogaert et. al, 2022). This gave reason to this project's urgency to assess in the preoperative phase to then order consultation for osteopathic medicine immediately after the patient recovered in PACU. It was vital that these patients received OMM as soon as they were stable and appropriate.

It is important to note that this project brings light to an expansion to our multi-modal approach with interdisciplinary team encouragement and proper assessment preoperatively. In our spinal surgery patient population all patients are found to have chronic pain that has not been managed through other interventions which lead them to intervene with surgery. While this project is not aimed towards fixing pain and anxiety with osteopathic manipulative medicine alone it celebrates the implementation as a complementary method. Per Gustowski et. al, "so many systems are involved in the generation of a chronic pain state, including emotional and

psychological systems, identifying one therapy that is curative is challenging. Research continues to emerge that demonstrates the efficacy of multidisciplinary team approach to chronic pain management" (2024). During implementation of this project, once osteopathic manipulative medicine was consulted each patient received an individualized plan for management of their pain and anxiety. The interventions used in this project by the osteopathic doctor included, balanced ligamentous tension and myofascial release. There is evidence that supports both of these methods for pain and anxiety management.

In multiple studies it was found that early use of OMM prior to surgery also lowered surgical intervention as it reduced low back pain even for three months after intervention (Licciardone et. al, 2005). While this project did not focus on the effects on OMM prior to surgery, it is imperative to note that implementing and educating patients about this alternative therapy can further disseminate awareness of the effectiveness of other modalities for their musculoskeletal pain. Furthermore, in a randomized controlled study about rehabilitation with osteopathic manipulative treatment (OMT) after lumbar disc surgery post-surgical disability improved more with OMT than controlled group. Findings noted leg pain decreased by about 30% more than the control group, pain average decreased by 20% more than control. Other findings were remarkable for less frequent medication use and high patient satisfaction (Kim et. al, 2015). While this project does not measure the rehabilitation phase using OMT it does open conversation and present opportunities for the patients to experience and learn about this alternative method which can lead to patients continuing past discharge.

Design

There were two evidence-based, standardized tools used in this project. One being Hospital Anxiety and Depression Scale (HADS) and the other being the Visual Analog Scale

(VAS). HADS was used to measure the level of anxiety and depression the patient has. VAS was used to measure the amount of pain they have. These were completed at pre-op and at discharge. During pain and anxiety assessment brief introductory education about osteopathic interventions was provided. Osteopathic interventions will be determined by the osteopathic provider at consultation. These interventions will be implemented in addition to our standard care including current multi-modal pharmacological regimens as needed. After the interventions are implemented, screening tools will be completed just prior to discharge to reassess the effectiveness of the interventions. Once benefit is proven, implementation of these screening tools or increased use of osteopathic interventions for our spinal surgery patients would reflect into our standardized practice.

Methods and Justification

A chart review was done for prospective spinal surgery candidates that had a history of chronic pain, anxiety or both. The Hospital Anxiety and Depression Scale and Visual Analog Scale were only completed with OMM agreeable spinal surgery patients. Once consented to proceed, HADS and VAS completed in preoperative stage and then again at discharge from hospital via in hospital or phone call. Twenty spinal surgery patients were assessed over a 4-month time frame, although seven refused to move forward with OMM for various reasons. Thirteen patients completed OMM through hospitalization till discharge. Once consulted, each patient had an individualized OMM treatment plan made by our osteopathic care team. Therefore, the number of sessions and types of treatments differed patient-to-patient. Two interventions were provided to all patients including, balanced ligamentous tension and myofascial release. OMM was an addition and complementary modality to pain and anxiety

regimen which may or may not have included opioids, benzodiazepines, nerve blocks, non-opioid analgesics, patient-controlled analgesia and etc.

Ethical Considerations

This study was approved by the Institutional Review Board of the University of San Diego, Hanh's School of Nursing (IRB-2021-47).

Results

There were a total of 20 spinal surgery patients assessed preoperatively, 13 participated fully in the project, 7 refused OMM. For this evidence-based project, scores were gathered from the preoperative and discharge scores for each standardized tool including Hospital Anxiety and Depression Scale (HADS) and the Visual Analog Scale (VAS). The HAD scale is measured within a numerical range from 0 to 21 with normal being 0 to 7, borderline abnormal 8-10, and abnormal being 11 to 21. Figure 1.1 and 1.2 represents the compared scores for each patient using HADS at preop and discharge. With the highest score being 17 for anxiety and 14 for depression. It is pivotal to highlight that only 5 of the 13 patients were officially diagnosed with anxiety or depression prior to my assessment and used anti-anxiety medications for management prior to admission. Despite this, in the preoperative phase 5 patients scored borderline and 5 patients scored abnormal for anxiety. Compared to at discharge where 5 remained borderline and none scored abnormally. Incidentally, one patient that had refused OMM had hospitalization complicated by anxiety and depression triggered by complicated surgery and admission needing psych consult. Assessing our spinal surgery patients preoperatively for anxiety and depression, despite having no official history of anxiety or depression can be monumental in preventing missed diagnosis, proper treatment plans or delayed intervention.

Figure 1.1

Anxiety Using Hospital and Anxiety Depression Scale

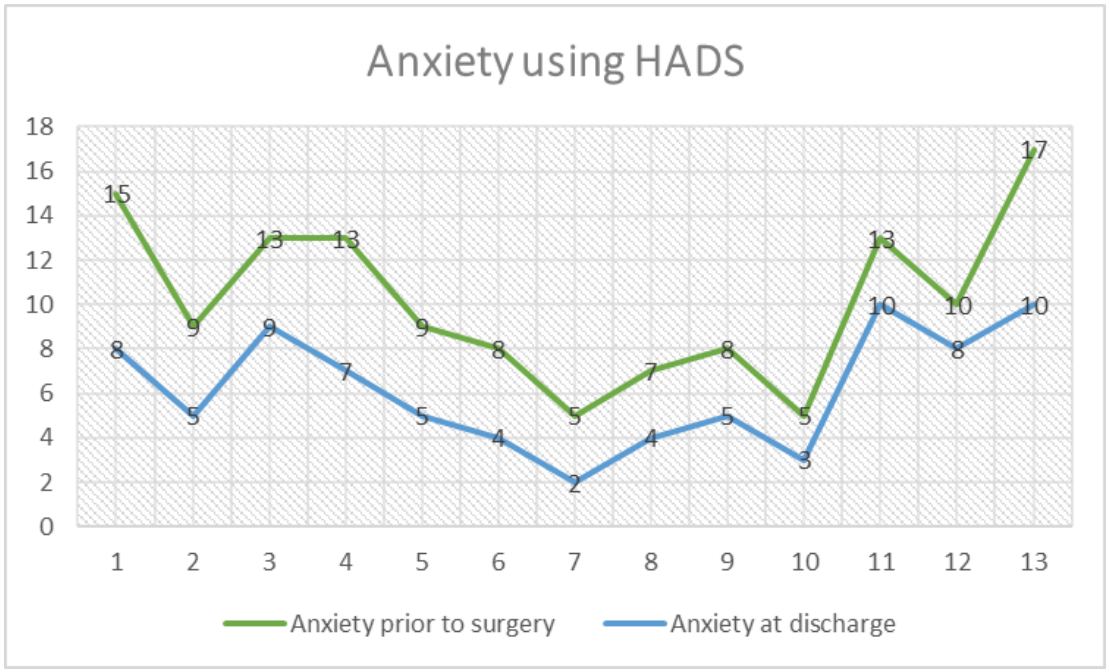
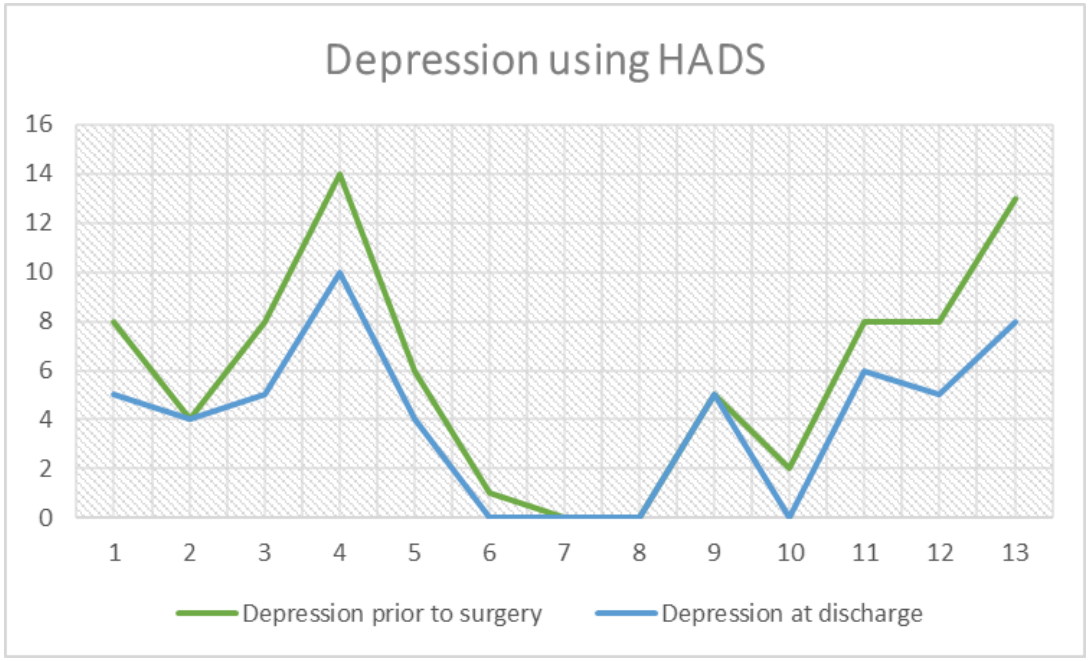


Figure 1.2

Depression Using Hospital Anxiety and Depression Scale



Improvement percentage was measured after analysis of data from above charts and was notable for an improvement of 38% for anxiety and 32% for depression at discharge compared to preoperative stage. This is visualized in the below charts Figure 2.1 and 2.2 including the change in percentage of anxiety and depression.

Figure 2.1

Change of Anxiety (%) Pre and Post (n=13)

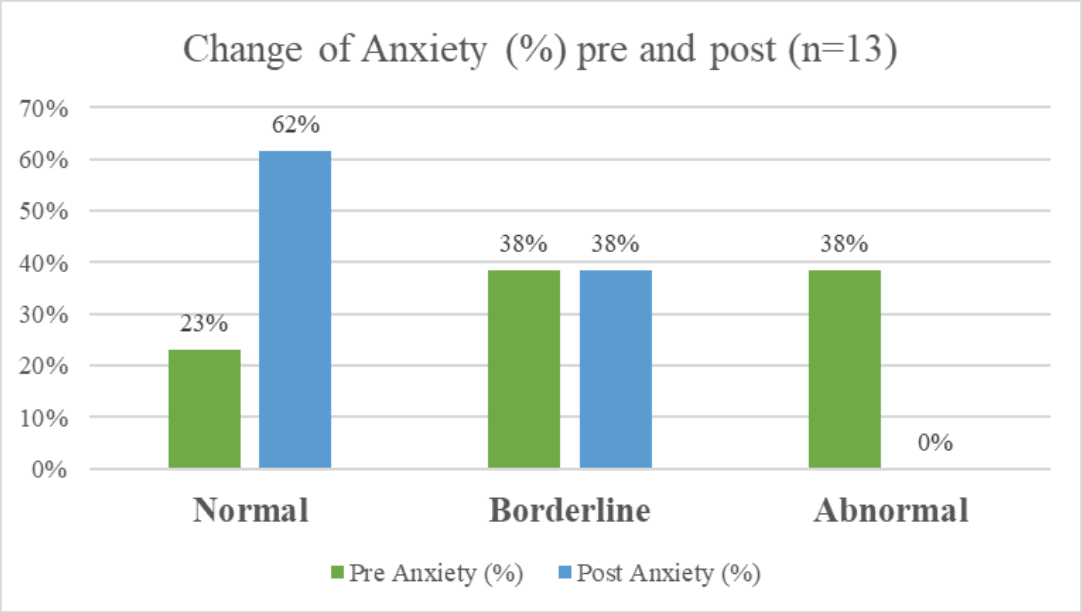
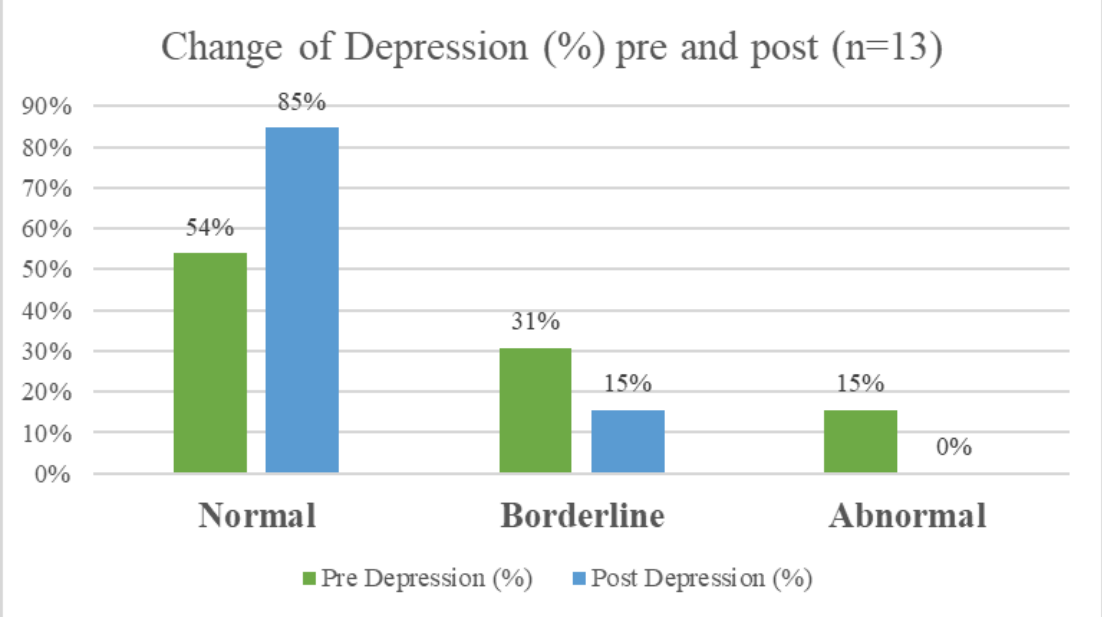


Figure 2.2

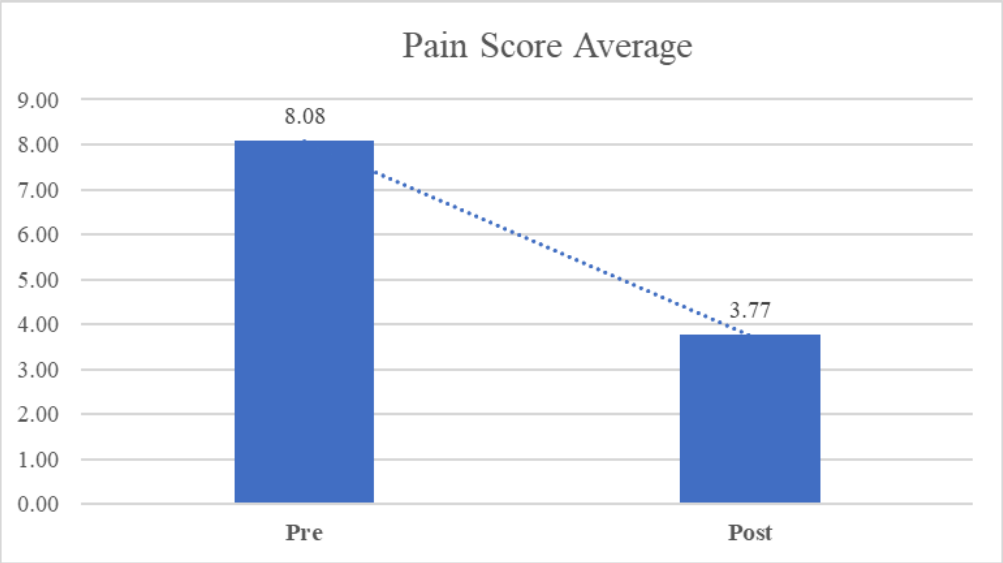
Change of Depression (%) Pre and Post (n=13)



In addition to anxiety and depression that was measured in this project, pain was also included. All 13 patients had scheduled spinal surgery for chief complaints of chronic neck or back pain. Chronic opioid use was documented notable for 11 of 13 patients using opioids chronically with 2 patients refusing opioids due to their side effects. This finding calls attention to the opioid-dependence this population often has making pain management difficult if treated solely with opioids. Furthermore, adequate pain management is a goal for safe discharge so ensuring pain was controlled when reassessing pain level was important. The standardized tool used to measure pain was the Visual Analog Scale. In the preoperative phase, the average pain score was 8.08 and decreased to 3.77 at time of discharge, shown in Figure 3.1.

Figure 3.1

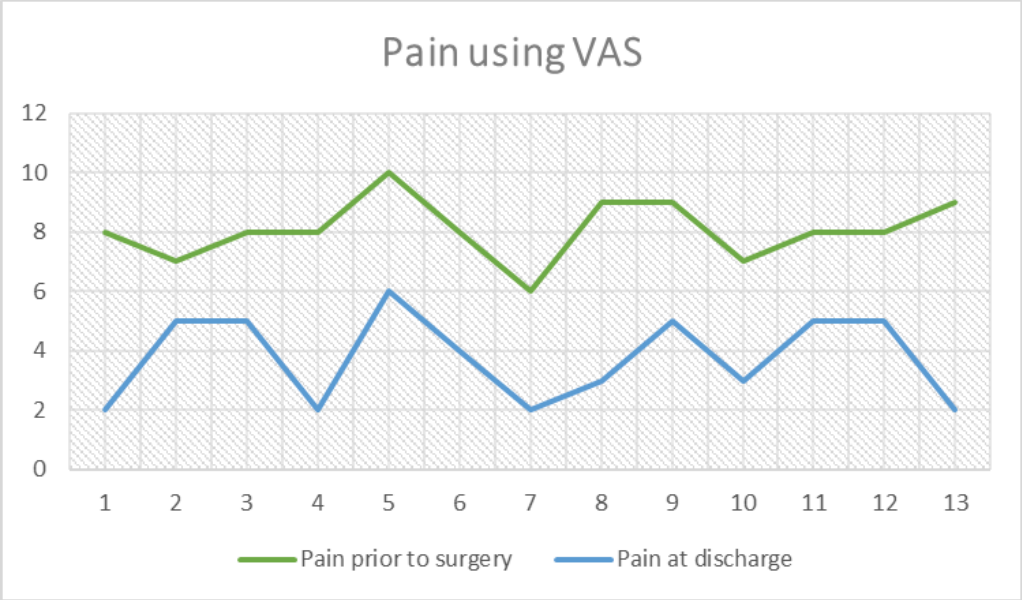
Pain Score Average



When reviewing the percentage of pain improvement from preoperative to discharge phase there was 43% of pain, shown in Figure 3.2 below. 11 out of the 13 patients had opioids as part of their pain regimen, 1 needing a dilaudid PCA.

Figure 3.2

Pain Score Using Visual Analog Scale



A chart review was completed on the patients that refused OMM to assess for any hospital course changes that OMM could have helped mitigate. Incidentally, one elderly patient that had refused OMM had hospitalization complicated by delirium due to opioid use. This is a common complication that occurs with patients, especially our elderly population in the hospital. Additionally, due to the small sample size of this study measuring the amount of opioids used for each patient to assess the decrease in number of opioids needed for pain control was not able to be included, a larger sample size study is needed. Length of stay was also not included in this study due to the varying complexity of the patients' comorbidities and surgeries.

See figure 4 below for standardized tools used in this project.

Figure 4

Figure 4.1 Hospital Anxiety and Depression Scale

Hospital Anxiety and Depression Scale (HADS)

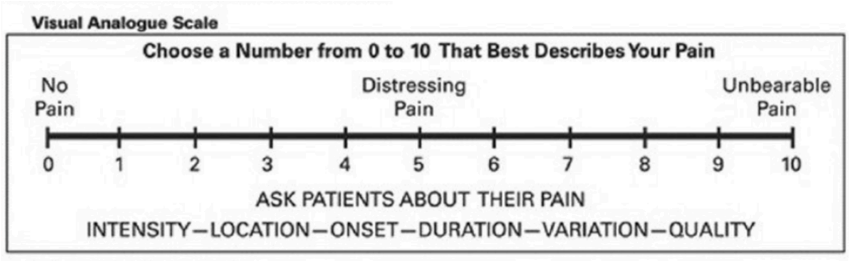
Tick the box beside the reply that is closest to how you have been feeling in the past week.
Don't take too long over you replies: your immediate is best.

D	A		D	A	
		I feel tense or 'wound up':			**I feel as if I am slowed down:**
	3	Most of the time	3		Nearly all the time
	2	A lot of the time	2		Very often
	1	From time to time, occasionally	1		Sometimes
	0	Not at all	0		Not at all
		I still enjoy the things I used to enjoy:			**I get a sort of frightened feeling like 'butterflies' in the stomach:**
0		Definitely as much		0	Not at all
1		Not quite so much		1	Occasionally
2		Only a little		2	Quite Often
3		Hardly at all		3	Very Often
		I get a sort of frightened feeling as if something awful is about to happen:			**I have lost interest in my appearance:**
	3	Very definitely and quite badly	3		Definitely
	2	Yes, but not too badly	2		I don't take as much care as I should
	1	A little, but it doesn't worry me	1		I may not take quite as much care
	0	Not at all	0		I take just as much care as ever
		I can laugh and see the funny side of things:			**I feel restless as I have to be on the move:**
0		As much as I always could		3	Very much indeed
1		Not quite so much now		2	Quite a lot
2		Definitely not so much now		1	Not very much
3		Not at all		0	Not at all
		Worrying thoughts go through my mind:			**I look forward with enjoyment to things:**
	3	A great deal of the time	0		As much as I ever did
	2	A lot of the time	1		Rather less than I used to
	1	From time to time, but not too often	2		Definitely less than I used to
	0	Only occasionally	3		Hardly at all
		I feel cheerful:			**I get sudden feelings of panic:**
3		Not at all		3	Very often indeed
2		Not often		2	Quite often
1		Sometimes		1	Not very often
0		Most of the time		0	Not at all
		I can sit at ease and feel relaxed:			**I can enjoy a good book or radio or TV program:**
	0	Definitely	0		Often
	1	Usually	1		Sometimes
	2	Not Often	2		Not often
	3	Not at all	3		Very seldom

Please check you have answered all the questions

Scoring:
Total score: Depression (D) _____ Anxiety (A) _____
0-7 = Normal
8-10 = Borderline abnormal (borderline case)
11-21 = Abnormal (case)

Figure 4.2 Visual Analog Scale



During each osteopathic medicine consultation and follow-up intervention, the osteopathic doctor would assess effectiveness of treatment after implementation of OMM by verbalization of improved pain and anxiety by end of visit. 100% of patients verbalized OMM improved their pain and anxiety immediately following intervention 100% of the time. In addition to this measurement, the number of OMM consults was analyzed using the Slicer Dicer tool within the EPIC medical record system. With the help of an EPIC data analyst, it was found that OMM consults increased by 18% over the 4-month time frame during implementation of the project compared to 4-month time prior to implementation. This increase in the number of consults was used to estimate the cost-benefit analysis of this project.

When completing a cost-benefit analysis, it is important to bring attention to the many qualitative benefits of this project including decrease pain and anxiety postoperatively. When assessing costs, per CPT charge of OMM averages to about $200. There is no increased cost to educate and consult the patient for OMM due to the usual salary-based structure of the advanced practice provider. Therefore, based on the 18% increase of consults over a 4 month time frame, there is an increase in revenue by $1,800 if there was only one session per patient. Making implementation of OMM during hospitalization for spinal surgery cost-effective with quantitative benefit.

Study Limitations

This evidence-based project was a smaller sample size of 20 patients with 7 refusal of OMM which had a limited range of data due to this. This type of project would benefit greatly from a larger sample size in order to assess the decrease in opioid use with implementation of OMM. Within the group of patients that had refused OMM a number of patients expressed an unwillingness to try alternative modalities. There was a lack of readiness for education about

osteopathic modalities making introduction to this additional intervention difficult. There was also difficulty with translation of the Hospital Anxiety and Depression Scale with our non-english speaking patients. Many times the translator was not able to directly translate what was said on the tool, therefore it is warranted that a spanish version of this tool or an alternative tool may be needed. Another limitation was this populations' range of complex conditions and surgeries that complicated hospital length of stay.

Most importantly it is notable that pain and anxiety are complex conditions that call for a multi-modal approach to optimize management. Due to this, we can not determine if osteopathic medicine alone would decrease either of these symptoms. It is stressed that this is an additional modality to be used with standard care to promote better patient outcomes and address our patients' multifactorial pain and anxiety.

Discussion

Overall, the aim of decreasing pain and anxiety in the spinal surgery patient population was achieved. This can indirectly have effects in other areas of medicine that need addressing such as, providing a more holistic, multi-modal approach to pain and anxiety management. The spinal surgery patient population has a higher risk for chronic pain, opioid-dependence, anxiety and depression due to the nature of their complex medical history and surgery. There is a potential to decrease the risk of opioid or benzodiazepine related delirium in our elderly surgery population by implementing alternative pain and anxiety management. Additionally, when approaching the patients in preop there was apparent lack of awareness as to what osteopathic medicine is, the services that are offered and their benefits. While there is a stigma of alternative therapy as not "being effective", there is competing evidence that supports the various benefits that come with implementing osteopathic modalities into practice. Implementation of osteopathic

medicine can show benefit in not only the preoperative and discharge phase, but also as preventative and maintenance management. Increase in education of these alternative methods to our patients can help spread awareness which will lead to increase in openness of their implementation. This can only be achieved with effective interdisciplinary collaboration for patient-centered care. This may help to address not only the physical needs of our patients, but their psychological well-being as well. If the patient is made aware of the rising evidence that supports incorporating osteopathic medicine, standardized tools are used to measure effectiveness, and there is interdisciplinary collaboration, success of future implementation could hold great success in providing better patient outcomes for this and other patient populations.

Evidence to Action

Supported in the above literature review and standardized tool findings, four recommendations to provide a start to regularly integrating evidence-based practice osteopathic medicine interventions for pain and anxiety management surgery patients are as follows:

1. Institutions must have osteopathic medicine services available for patient population and advanced care providers that are well-versed in educating their patients about these services that could potentially be implemented as key for patient-driven decision making.
2. A multi-modal approach to treatment plans has to be celebrated as a priority in order to lead to better patient outcomes of their physical and psychological well-being and reduce risk for complications.
3. Strong interdisciplinary team collaboration is needed to enable appropriate consultation and inclusion of consulted team members to personalize the patients treatment plans.
4. High risk patients such as opioid dependent, elderly, and past medical history of associated conditions should always be included when considering OMM and should be

flagged to bring attention to potential complications of hospital admission.

Implications for Future Research

The gaps in the proper and timely assessment of pain and anxiety in our spinal surgery patients are wide and require intervention. While there is evidence that highlights the detriment that surgery has on the patient's physical and psychological state specifically in regards to pain, anxiety and depression, evidence should be geared towards including all of these as they are related to osteopathic medicine and spinal surgery. There should be more readily available evidence that supports this specific population due to their high risk of long hospitalization, morbidity and mortality. Further research should include a larger sample study to better determine how great incorporating OMM into standard practice can be to help fight our opioid crisis by providing alternative pain management. With a larger sample size it can also be determined how effective this intervention has by creating better pain control within our opioid-dependent patients without escalation of pharmacologic methods. Research should also emphasize the importance of spreading awareness of alternative non-pharmacological modalities into standard practice to enable familiarity of osteopathic medicine.

Conclusions

Musculoskeletal conditions are the most common causes of disability and pain. Opioid-dependence is very common with patients that have musculoskeletal conditions, especially ones with back pain. By assessing pain prior to surgery this leads to a better plan to address pain peri-operatively with additional modalities, as necessary. This will also promote nonpharmacological pain management to fight our opioid crisis. This patient population also has high levels of anxiety due to chronic pain and anticipation of surgery with future pain. It is important to be aware of this to implement interventions that can mitigate these symptoms. By

proper, proactive assessment of pain and anxiety in high risk populations, introducing and educating our patients of osteopathic medicine services, measuring the effectiveness through standardized tools, incorporation of OMM and open interdisciplinary collaboration we can address this populations often missed psychological distress and ineffective pharmacological pain regimens to promote better patient outcomes.

References

Abraham C, Sloan SNB, Coker C, Freed B, McAuliffe M, Nielsen H, Riscoe T, Steele R, Dettwiler A, Oberley G, Zaremski K, Joy K, Selby A, Wells-Lewis R, Creamer BA. Osteopathic Manipulative Treatment as an Intervention to Reduce Stress, Anxiety, and Depression in First Responders: A Pilot Study. Mo Med. 2021 Sep-Oct;118(5):435-441. PMID: 34658436; PMCID: PMC8504517.

Ajimsha MS, Al-Mudahka NR, Al-Madzhar JA. Effectiveness of myofascial release: systematic review of randomized controlled trials. J Bodyw Mov Ther. 2015 Jan;19(1):102-12. Doi: 10.1016/j.jbmt.2014.06.001. Epub 2014 Jun 13. PMID: 25603749.

Arienti, C., Daccò, S., Piccolo, I. et al. Osteopathic manipulative treatment is effective on pain control associated to spinal cord injury. Spinal Cord 49, 515–519 (2011). https://doi.org/10.1038/sc.2010.170

Bogaert L, Thys T, Depreitere B, Dankaerts W, Amerijckx C, Van Wambeke P, Jacobs K, Boonen H, Brumagne S, Moke L, Schelfaut S, Spriet A, Peers K, Swinnen TW, Janssens L. Rehabilitation to improve outcomes of lumbar fusion surgery: a systematic review with meta-analysis. Eur Spine J. 2022 Jun;31(6):1525-1545. doi: 10.1007/s00586-022-07158-2. Epub 2022 Mar 8. PMID: 35258644.

Brunt BA, Morris MM. Nursing Professional Development Evidence-Based Practice. [Updated 2023 Mar 4]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK589676/

Cheng H, Liu J, Shi L, Hei X. The Rehabilitation-Related Effects on the Fear, Pain, and Disability of Patients With Lumbar Fusion Surgery: A Systematic Review and

Meta-Analysis. Neurospine. 2023 Mar;20(1):278-289. doi: 10.14245/ns.2245056.528. Epub 2023 Mar 31. PMID: 37016875; PMCID: PMC10080435.

Cho, Y., Kim, C., Heo, K., Lee, M. S., Ha, I., Son, D. W., Choi, B. K., Song, G., & Shin, B. (2014). Acupuncture for acute postoperative pain after back surgery: A systematic review and meta‐analysis of randomized controlled trials. Pain Practice, 15(3), 279-291. https://doi.org/10.1111/papr.12208

Deshpande, N., Hadi, M., Mansour, T. R., Telemi, E., Hamilton, T., Hu, J., Schultz, L., Nerenz, D. R., Khalil, J. G., Easton, R., Perez-Cruet, M., Aleem, I., Park, P., Soo, T., Tong, D., Abdulhak, M., Schwalb, J. M., & Chang, V. (2024). The impact of anxiety and depression on lumbar spine surgical outcomes: a Michigan Spine Surgery Improvement Collaborative study. *Journal of Neurosurgery: Spine* (published online ahead of print 2024). https://doi.org/10.3171/2023.12.SPINE23860

Edwards, D. J. (2018, May 11). Osteopathy can be used to treat mental health issues related to back pain – new study. The Conversation. https://theconversation.com/osteopathy-can-be-used-to-treat-mental-health-issues-related-to-back-pain-new-study-94845

Elsayyad MM, Abdel-Aal NM, Helal ME. Effect of Adding Neural Mobilization Versus Myofascial Release to Stabilization Exercises after Lumbar Spine Fusion: A Randomized Controlled Trial. Arch Phys Med Rehabil. 2021 Feb;102(2):251-260. doi: 10.1016/j.apmr.2020.07.009. Epub 2020 Aug 19. PMID: 32827553.

Gustowski, S., Slicho, T., & Newsome, D. (2024). Integration of Osteopathic Manipulative Treatment for Patients with Chronic Pain. *Missouri Medicine*, *121*(1).

https://digitalcommons.kansascity.edu/cgi/viewcontent.cgi?article=1557&context=facultypub

Jarski RW, Loniewski EG, Williams J, Bahu A, Shafinia S, Gibbs K, Muller M. The effectiveness of osteopathic manipulative treatment as complementary therapy following surgery: a prospective, match-controlled outcome study. Altern Ther Health Med. 2000 Sep;6(5):77-81. PMID: 10979164.

Johns Hopkins Medicine. (2014). Survey shows spine surgeons need to screen more patients for anxiety and depression. https://www.hopkinsmedicine.org/news/media/releases/survey_shows_spine_surgeons_need

Kim, B. J., Ahn, J., Cho, H., Kim, D., Kim, T., & Yoon, B. (2015). Rehabilitation with osteopathic manipulative treatment after lumbar disc surgery: A randomised, controlled pilot study. International Journal of Osteopathic Medicine, 18(3), 181-188. https://doi.org/10.1016/j.ijosm.2014.11.003

Licciardone, J.C., Brimhall, A.K. & King, L.N. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials. *BMC Musculoskelet Disord* **6**, 43 (2005). https://doi.org/10.1186/1471-2474-6-43

Nicholas, A., & Oleski, S. (2002). Osteopathic manipulative treatment for postoperative pain. Journal of Osteopathic Medicine, 102(9). https://doi.org/10.7556/jaoa.2002.20015

Nitin K Prabhakar, Andrea L Chadwick, Chinwe Nwaneshiudu, Anuj Aggarwal, Vafi Salmasi, Theresa R Lii & Jennifer M Hah (2022) Management of Postoperative Pain in Patients Following Spine Surgery: A Narrative Review, International Journal of General Medicine, 15:, 4535-4549, DOI: 10.2147/IJGM.S292698

Rönnberg K, Lind B, Zoëga B, Halldin K, Gellerstedt M, Brisby H. Patients' satisfaction with provided care/information and expectations on clinical outcome after lumbar disc herniation surgery. Spine (Phila Pa 1976). 2007 Jan 15;32(2):256-61. doi: 10.1097/01.brs.0000251876.98496.52. PMID: 17224823.

Strøm J, Bjerrum MB, Nielsen CV, Thisted CN, Nielsen TL, Laursen M, Jørgensen LB. Anxiety and depression in spine surgery-a systematic integrative review. Spine J. 2018 Jul;18(7):1272-1285. doi: 10.1016/j.spinee.2018.03.017. Epub 2018 Apr 9. PMID: 29649613.

Teles, A. R., Khoshhal, K. I., & Falavigna, A. (2016). Why and how should we measure outcomes in spine surgery? Journal of Taibah University Medical Sciences, 11(2), 91-97. https://doi.org/10.1016/j.jtumed.2016.01.003

Yerneni, K., Nichols, N., Abecassis, Z. A., Karras, C. L., & Tan, L. A. (2020). Preoperative opioid use and clinical outcomes in spine surgery: A systematic review. Neurosurgery, 86(6), E490-E507. https://doi.org/10.1093/neuros/nyaa050

Appendix A IRB Approval

September 29, 2023

Summer Barnes
Hahn School of Nursing & Health Science

Re: Initial - IRB-2024-20 A Multi-Modal Approach: Measuring The Effectiveness of Osteopathic Interventions on Spinal Surgery Patients' Pain and Anxiety

Dear Summer Barnes:

The Hahn School of Nursing & Health Science faculty representative(s), as an official part of the University of San Diego Institutional Review Board (USD IRB), have reviewed your application and rendered the decision below for IRB-2024-20: A Multi-Modal Approach: Measuring The Effectiveness of Osteopathic Interventions on Spinal Surgery Patients' Pain and Anxiety.

Decision: Non-research or Not-human subjects research. This study may start no earlier than September 29, 2023.

Findings: This study relies on the external UCSD Acguire IRB decision, stating that the project is non-research/not-human subjects research. Despite the non-research/non-human subjects research nature of the project, researchers should still ensure that the activities associated with the project are conducted in compliance with applicable USD policies and ethical standards as well as local, state, and federal regulations.
This application has been reviewed and certified by the corresponding unit's IRB Org Approver(s).

Researcher Notes: N/A Though certified as either non-research or not-human subjects research, the project team should ensure that the activities associated with the project are conducted in compliance with applicable USD policies and ethical standards as well as local, state, and federal regulations.

Internal Notes:

This approval is based on the intended work and scope of activities outlined in the submitted proposal. If the research team makes changes to the project and/or its study protocols, the PI or their designated team member must submit a modification application for IRB's re-evaluation.

The USD IRB requires annual renewal of all active studies reviewed and approved by the IRB. Please submit an application for renewal prior to the annual anniversary date of initial study approval.
If an application for renewal is not received, the study will be administratively closed.

Note: We send IRB correspondence regarding student research to the faculty advisor, who bears the ultimate responsibility for the conduct of the research. We request that the faculty advisor share this correspondence with the student researcher.

Applications for full review must be submitted at least two weeks prior to the next scheduled monthly IRB meeting; see https://www.sandiego.edu/irb/updates/ for specific deadlines. You may submit an IRB application for expedited or exempt review at any time.

Sincerely,

Hahn School of Nursing and Health Science IRB Org Approver(s)

Institutional Review Board
University of San Diego
5998 Alcalá Park, San Diego, CA 92110-2492
Phone (619) 260-4553 • Fax (619) 260-2210 • www.sandiego.edu

Appendix B UCSD Acquire Approval

Date: 9/8/2023

To: Summer Barnes and Melissa Garth

Re: Project #872

A Multi-Modal Approach: Measuring the Effectiveness of Osteopathic Interventions on Spinal Surgery Patients' Pain and Anxiety

Hello,

Your project has been reviewed by the UCSD ACQUIRE (Aligning and Coordinating Quality Improvement, Research, and Evaluation) Committee. The ACQUIRE Committee approval of this project included a determination that the project is not regulated as research involving human subjects as defined in 45 CFR 46 or 21 CFR 56 and does not require Institutional Review Board review or approval. Consistent with UCSD policy and federal regulations, the UCSD Office of IRB Administration (OIA) has delegated authority to the ACQUIRE Committee to make such determinations. The Director and/or Medical Director of the Office of IRB Administration (OIA) are members of the ACQUIRE Committee.

Though certified as not human subjects research, the project leader should ensure that the activities associated with the project are conducted in compliance with applicable UCSD and Rady Children's Hospital-San Diego policies and ethical standards as well as local, state, and federal regulations.

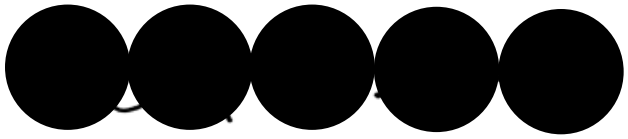
In addition, this approval is based on the intended work and scope of activities outlined in the proposal that was submitted in the following pages of this letter. If the nature or scope of this activity changes substantially, then a re-evaluation by the ACQUIRE Committee would be necessary.

Also, please note the following suggestions from the reviewers:

- Your ROI calculation seems like it underestimates. I think you need to multiply the fraction by 100, not 10 to get an ROI of 1650% (based on your numbers).
-

Should you have any questions, please contact the Robert El-Kareh at relkareh@health.ucsd.edu.

Sincerely,



Robert El-Kareh, MD, MS, MPH
Chair, ACQUIRE Committee

Appendix C Poster Abstract

Introduction: The purpose of this evidence-based practice Doctor of Nursing Practice (DNP) project was to encourage thorough assessment of pain and anxiety prior to spinal surgery in order to identify the need for implementation of additional modalities, such as osteopathic interventions for pain and anxiety management. It is pertinent that as holistic providers we address this populations often missed psychological distress and ineffective pharmacological pain regimens to promote better patient outcomes.
Background: Research says there are approximately 1.62 million instrumented spinal procedures performed annually in the United States. Spinal surgery is not uncommon, and neither is the chronic pain and anxiety it is associated with. Osteopathic manipulative medicine (OMM) has been found effective and is commonly used as a non-pharmacological, alternative modality used for pain. Chronic pain is also often associated with anxiety and depression. It has been shown that OMM may help reduce anxiety and psychological distress in those experiencing pain due to musculoskeletal disorders.
Methods: Assess anxiety (Hospital Anxiety and Depression Scale/HADS) and pain (Visual Analog Scale/VAS) using valid standardized tools preoperatively and postoperatively of agreeable spinal surgery patients. An OMM consult was placed immediately postoperative and continued throughout hospitalization for appropriate and agreeable patients. Osteopathic interventions will be determined by the osteopathic provider at consultation. These interventions will be implemented in addition to our standard care including current multi-modal pharmacological regimens as needed. Results were measured by the number of OMM consults, as well as, pain and anxiety immediately after OMM and around the time of discharge.
Results: There were a total of 20 spinal surgery patients assessed preoperatively, 13 of those patients participated fully in this project, 7 refused OMM. From the 13 patients, we have seen an improvement in pain, anxiety and depression. Out of 13 patients that underwent OMM, 100% verbalized that intervention improved pain and anxiety immediately after intervention. Using the standardized tools: pain was improved by 43%, anxiety improved by 38%, and depression improved by 32% around time of discharge. The amount of OMM consults increased by 18% over a 4 month time frame prior to implementation of the project and during. Length of stay was unable to be determined due to the high complexity of these patients' surgeries and hospital stays complicated by their multiple comorbidities, therefore was excluded from results as a reliable depiction of intervention effectiveness in this study.
Evaluation: While this is a small study, based on the results there shows great promise that considering ordering OMM early in this population can benefit their recovery postoperatively by decreasing pain and anxiety/depression. Incidentally, we were able to introduce and educate patients of alternative modalities for pain, anxiety/depression management. There were barriers including language barriers and translation of anxiety assessment tools and refusal of alternative medicine. Additional implementation into practice over longer periods of time is needed to expand results and determine true effectiveness of incorporating OMM for our spinal surgery patients.

Appendix D Poster

A Multi-Modal Approach: Implementing OMM for Spinal Surgery Patients' Pain and Anxiety

Summer Trinity Barnes BSN, RN
Melissa Garth MSN, ACNP-BC, CCRN
Joseph Burkard, DNSc, CRNA

Background

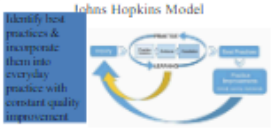
- Research says there are approximately 1.62 million instrumented spinal procedures performed annually in the United States. Spinal surgery is not uncommon, and neither is the chronic pain and anxiety in which it is associated with.
- Osteopathic manipulative medicine (OMM) has been found effective and is commonly used as a non-pharmacological, alternative modality used for pain. Chronic pain is also often associated with anxiety and depression. It has also been shown that OMM may help reduce anxiety and psychological distress in those experiencing pain due to musculoskeletal disorders.

Purpose

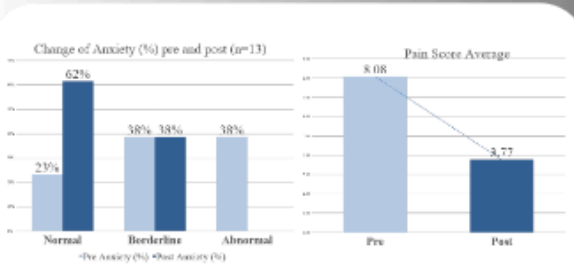
- To encourage thorough assessment of pain and anxiety prior to spinal surgery
- Address this populations often missed psychological distress and ineffective pharmacological pain/anxiety regimens to promote better patient outcomes.

Framework/EBP Model

Johns Hopkins Model



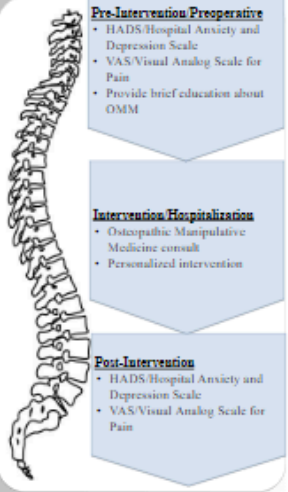
Evaluation Results



Evidence for Problem

- "…only 10 percent of orthopaedic surgeons and neurosurgeons follow recommended use of psychological screenings prior to surgery" (Johns Hopkins, 2014).
- "It is estimated that between 25% and 80% of patients admitted to hospital for surgery experience preoperative anxiety and anxiety can negatively influence patient recovery" (Stamenkovic et. al, 2018)
- "Furthermore, preoperative opioid use prior to spine surgery has been reported to range from 20% to over 70%, with nearly 20% of this population being opioid dependent" (Ketan et. al, 2020).
- There is an apparent gap in identifying and mitigating anxiety and pain, their relationship to one another, and spinal surgery.

Project Plan Process



Pre-Intervention/Preoperative
- HADS/Hospital Anxiety and Depression Scale
- VAS/Visual Analog Scale for Pain
- Provide brief education about OMM

Intervention/Hospitalization
- Osteopathic Manipulative Medicine consult
- Personalized intervention

Post-Intervention
- HADS/Hospital Anxiety and Depression Scale
- VAS/Visual Analog Scale for Pain

Cost-Benefit Analysis

- Qualitative benefit: decrease in pain and anxiety for our patients' postoperatively
- Costs per CPT charge of OMM averages to about $200
- There is no increase cost to educate and consult the patient for OMM due to the usual salary-based structure of the APP
- Therefore, based off the 18% increase of consults over 4 month time frame, there is an increase in revenue by $1,800 if there was only one session per patient

Implications for Clinical Practice

- Opioid-dependence is very common with patients that have musculoskeletal conditions, especially ones with back pain. By assessing pain prior to surgery leads to a better plan to address it perioperatively with additional modalities, as necessary. This will also promote nonpharmacological pain management to fight our opioid crisis.
- This patient population also has high levels of anxiety due to chronic pain and anticipation of surgery with future pain. It is important to be aware of this to implement interventions that can mitigate these symptoms for better outcomes.

Evidence-Based Intervention/Benchmark

- Include HADS and VAS, valid standardized tools, preoperatively and postoperatively.
- Order osteopathic interventions immediately postoperative and continue throughout hospitalization.

Conclusions

- Total of 20 spinal surgery patient assessed preoperatively, 13 participated fully in project, 7 refused OMM
- 100% verbalized OMM improved their pain & anxiety immediately after intervention
- Improvement % using evidence-based standardized tools at time of discharge: Pain 43%, Anxiety 38%, Depression 32%
- OMM consults increased by 18% over a 4-month time frame

Appendix E UCSD Conference Approval

From: Nethercot, Darryl <dcnethercot@health.ucsd.edu>
Sent: Sunday, March 24, 2024 3:01 PM
To: Nursing Research & EBP Board NREBP <ucsdnursingresearch@health.ucsd.edu>
Subject: Instructions for your poster submission for the UCSD Conference

Hello,

Congratulations again on your abstract submission being selected for a poster present at the **17th Annual UCSD EBP/Research Conference Day,** set to be held on Tuesday, June 11th, 2024, from 8 am-4.30 pm, at Liberty Station.

Below are the instructions on how to complete and submit your poster presentation. We are very excited to have this years conferenec be in person and we are excited to showcase your achievements.

Poster instructions:
We are changing the poster format this year.
Please read carefully.
Wonderful news: After approval of your content we will print your poster for you and bring it to the conference!

- **Create** the poster using the Mike Morrison method
- **Watch** this 20 min video to learn how to create your poster: https://www.youtube.com/watch?v=SYk29tnxASs
- **Create** the poster in either CANVA or powerpoint sizing the image to 30" x 40"
- **Include** a team picture or head shot on the poster
- **Award Notification**: We will be awarding one monetary poster award for the poster that creates the greatest impact with the least words.
- **Recognition Notification**: The best 3 posters will be used as templates for future use and featured on the EDR Nursing Resource Hub
- **Attachments:**
  - A powerpoint set to the proper size with a couple of examples and logos with instructions.
  - These instructions
- **Schedule** a work session if you need support to create your draft through this booking link: *https://outlook.office365.com/owa/calendar/AppointmentwithJudyDavidson@ucsdhs.onmicrosoft.com/bookings/jdavidson@health.ucsd.edu*

March 29, 2024	**Conference participation acceptance from 1st author**
April 24, 2024	**Poster 1st draft using attached template or similar Mike Morrison method, due for peer review. Send to:** ucsdnursingresearch@health.ucsd.edu
May 3, 2024	**Peer review feedback provided to presenters**
May 17, 2024	**Final draft of posters due**
Expectation for June 11	**You will stand by your poster to field questions at a break and a portion of the lunch/poster session. Split the time with teammates**
June 11, 2024	**Conference date** 0800 PLNU Liberty Station

Darryl Nethercot MSN, RN, CPTC, LSSBB

Appendix F Certification

CITI PROGRAM

Completion Date 21-Oct-2021
Expiration Date 20-Oct-2024
Record ID 45746199

This is to certify that:

Summer Barnes

Has completed the following CITI Program course:

Not valid for renewal of certification through CME.

Human Subjects Research - SBR
(Curriculum Group)
Social & Behavioral Research - Basic/Refresher
(Course Learner Group)
1 - Basic Course
(Stage)

Under requirements set by:

University of San Diego

CITI
Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?w25ac8019-3335-4821-a4d3-a861eca3d7d6-45746199

DNP Essential I: Scientific Underpinnings for Practice **NONPF: Scientific Foundation Competencies** *The scientific foundation of nursing practice has expanded and includes a focus on both the natural and social sciences including human biology, genomics, science of therapeutics, psychosocial sciences, as well as the science of complex organizational structures. In addition, philosophical, ethical, and historical issues inherent in the development of science create a context for the application of the natural and social sciences.*	**2.** Synthesize nursing and other scientific and ethical theories and concepts to create a foundation for advanced nursing practice.	**Fall 2021** - Utilized IOWA model to to analyze the process of the evidence-based practice project for prevention of fractures by implementing screening and preventative measures for osteoporosis (DNPC 611) - Explored and researched epidemilogical perspective of a screening program for osteoarthritis (DNPC 625) **Summer 2022** - Expand knowledge of financial aspect of advanced practice nursing including revenue and cost, ICD/CPM, return-on-investment, statistical analysis, etc. (DNPC 653) **Fall 2022** - Develop health assessment skills in order to properly assess each body system for suspected diagnosis to support or deduct differential diagnosis (APNC 521) - Understand the pathophysiology of complex disease processes (DNPC 622) - Acquire foundation of knowledge in primary care setting to diagnose and treat patients more common, simple conditions (NPTC 602) **Spring 2023** - Expand knowledge of advanced nursing practice in primary care setting to apply into clinical practice (ANPC 604) **Summer 2023**

		- Expand knowledge of the gerontological adult and understand the pathophysiology in regards to their disease progression and processes (NPTC 535)
DNP Essential II: Organizational & System Leadership for Quality Improvement & Systems Thinking **NONPF: Leadership Competencies/Health Delivery System Competencies** *Advanced nursing practice includes an organizational and systems leadership component that emphasizes practice, ongoing improvement of health outcomes, and ensuring patient safety. Nurses should be prepared with sophisticated expertise in assessing issues, and facilitating organization-wide changes in practice delivery. This also requires political skills, systems thinking, and the business and financial acumen needed for the analysis of practice quality and costs*.	**5.** Design, implement, and evaluate ethical health care delivery systems and information systems that meet societal needs and ensure accountability for quality outcomes.	**Spring 2022** - Completed a SWOT analysis on healthcare organization, "American College of Sports Medicine" (DNPC 626) - Created an executive summary for healthcare organization (DNPC 626) **Summer 2022** - Learn how to apply philosophy that will lead to reflective practice (DNPC 610) **Spring 2023** - Inquire about common issues found in the clinical setting and create a DNP project that is supported with current evidence to implement and result in better patient outcomes (DNPC 686)

DNP Essential III: Clinical Scholarship & Analytical Methods for Evidence-Based Practice **NONPF: Quality Competencies/Practice Inquiry Competencies** *Scholarship and research are the hallmarks of doctoral education. Although basic research is viewed as the first and most essential form of scholarly activity, an enlarged perspective of scholarship has emerged through alternative paradigms that involve more than discovery of new knowledge. These paradigms recognize: (1) the scholarship of discovery and integration ³ synthesizing traditions of academic life´ ; (2) isolated facts and make connections across disciplines through the scholarship of integration; and (3) the scholar applies knowledge to solve a problem via the scholarship of application that involves the translation of research into practice and dissemination and integration of new knowledge.*	**4.** Incorporate research into practice through critical appraisal of existing evidence, evaluating practice outcomes, and developing evidence-based practice guidelines.	**Spring 2023** - Obtain evidence to support perspective DNP project with help of available school databases (DNPC 686) - Be able to organize research and evidence by the level of quality and include quality, reliable, and valid evidence in perspective EBP project (DNPC 686) Summer 2022 - Practice calculations for return-on investment and cost-benefit analysis for implementation of evidence-based practice (DNPC 653) Summer 2023 - Develop evidence-based practice project by identifying clinical problem that needs to be addressed (DNPC 630)

DNP Essential IV: Information Systems/Technology & Patient Care Technology for Improvement & Transformation of Health Care **NONPF: Technology & Information Literacy Competencies** *DNP graduates are distinguished by their abilities to use information systems/technology to support and improve patient care and health care systems, and provide leadership within health care systems and/or academic settings. Knowledge and skills related to information systems/technology and patient care technology prepare the DNP graduates apply new knowledge, manage individual and aggregate level information, and assess the efficacy of patient care technology appropriate to a specialized area of practice along with the design, selection, and use of information systems/technology to evaluate programs of care, outcomes of care, and care systems. Information systems/technology provide a mechanism to apply budget and productivity tools, practice information systems and decision supports, and web-based learning or intervention tools to support and improve patient care.*	**7.** Incorporate ethical, regulatory, and legal guidelines in the delivery of health care and the selection, use, and evaluation of information systems and patient care technology.	**Spring 2022** - Introduce and support with evidence-based information a clinical data support system that can be integrated in the clinical setting (HCIN 540) Summer 2022 - Practice calculations for return-on investment and cost-benefit analysis for implementation of evidence-based practice (DNPC 653) Spring 2024 - Proficient in use of EPIC systems and navigating tools within medical records that can create more efficient SOAP notes (DNPC 630)

DNP Essential V: Health Care Policy for Advocacy in Health Care **NONPF: Policy Competencies** *Health care policy, whether created though governmental actions, institutional decision-making, or organizational standards, creates a framework that can facilitate or impede the delivery of health care services or the ability of the provider to engage in practice to address health care needs. Engagement in the process of policy development is central to creating a health care system that meets the needs of its constituents. Political activism and a commitment to policy development are central elements of DNP practice.*	**3.** Demonstrate leadership in collaborative efforts to develop and implement policies to improve health care delivery and outcomes at all levels of professional practice (institutional, local, state, regional, national, and/or international).	**Spring 2022** - Developed health policy analysis scholarly paper "Addressing Disparities in Physical Activity of Our Youth – Obesity and Musculoskeletal Health" (DNPC 648) - Analyzed bill H.R. 3772 "Stop Obesity in Schools Act of 2015" (DNPC 648) - Analyzed the health policy and legislation put into place by Democratic Senator Toni Atkins (DNPC 648) **Spring 2024** - Join national association of nurse practitioners and expand knowledge of current and active policies (DNPC 630)

DNP Essential VI: Interprofessional Collaboration for Improving Patient & Population Health Outcomes **NONPF: Leadership Competencies** *health care environment depends on the contributions of highly skilled and knowledgeable individuals from multiple professions. In order to accomplish the IOM mandate for safe, timely, effective, efficient, equitable, and patient-centered care in this environment, health care professionals must function as highly collaborative teams. DNPs have advanced preparation in the interprofessional dimension of health care that enable them to facilitate collaborative team functioning and overcome impediments to interprofessional practice. DNP graduates have preparation in methods of effective team leadership and are prepared to play a central role in establishing interprofessional teams, participating in the work of the team, and assuming leadership of the team when appropriate.*	**1.** Demonstrate advanced levels of clinical practice within defined ethical, legal, and regulatory parameters in designing, implementing, and evaluating evidenced-based, culturally competent therapeutic interventions for individuals or aggregates. **3.** Demonstrate leadership in collaborative efforts to develop and implement policies to improve health care delivery and outcomes at all levels of professional practice (institutional, local, state, regional, national, and/or international).	**Spring 2023** - Work closely with providers in the clinical setting to analyze ways to improve patient population health outcomes (DNPC 686) **Fall 2023** - Work in a post-acute and skilled nursing facility environment that has a range of acuity with mulitple comorbidities (NPTC 608 - Collaborate with nurse-driven team at skilled nursing facility to improve patient and population health outcomes (DNPC 630) - Provide leadership as a nurse practitioner in the skilled nursing facility as there is more autonomy in this setting (NPTC 608) **Spring 2024** - Collaborate with interdisciplinary teams in order to create sound treatment plan for complex patients (DNPC 630, APNC 609)

DNP Essential VII: Clinical Prevention & Population Health for Improving national health **NONPF: Leadership Competencies** *Consistent with national calls for action and with the longstanding focus on health promotion and disease prevention in nursing, the DNP graduate has a foundation in clinical prevention and population health. This foundation enables DNP graduates to analyze epidemiological, biostatistical, occupational, and environmental data in the development, implementation, and evaluation of clinical prevention and population.*	**6.** Employ a population health focus in the design, implementation, and evaluation of health care delivery systems that address primary, secondary, and tertiary levels of prevention.	**Fall 2021** - Developed a method of implementation for primary prevention screening plan for post-menopausal women with risk for osteoporosis (DNPC 611) **Spring** 2023 - Create evidence-based project that includes implementation of one level of prevention (DNPC 686) **Spring 2024** - Obtain clinical experience in the primary care setting and incorporate health promotion methods for clinical prevention (APNC 608) **Spring 2024** - Obtain clinical experience in both hospital and outpatient setting, follow guidelines for different settings, and treat patients in the secondary and tertiary level (APNC 609, DNPC 630)

DNP Essential VIII: Advanced Nursing Practice **NONPF: Independent Practice/Ethics Competencies** *The increased knowledge and sophistication of health care has resulted in the growth of specialization in nursing in order to ensure competence in these highly complex areas of practice. The reality of the growth of specialization in nursing practice is that no individual can master all advanced roles and the requisite knowledge for enacting these roles. DNP programs provide preparation within distinct specialties that require expertise, advanced knowledge, and mastery in one area of nursing practice. A DNP graduate is prepared to practice in an area of specialization within the larger domain of nursing.*	**1**. Demonstrate advanced levels of clinical practice within defined ethical, legal, and regulatory parameters in designing, implementing, and evaluating evidence-based, culturally competent therapeutic interventions for individuals or aggregates.	**Fall 2022** - Attend clinical rotation to meet mandatory hours to demonstrate advanced levels of clinical practice and become competent as a provider (APNC 602) - Understand scope of practice of NPs and the requirements to have independent practice (DNPC 630) **Spring 2023** - Attend clinical rotation to meet mandatory hours to demonstrate advanced levels of clinical practice and become competent as a provider (APNC 604) - Expand knowledge of advanced nursing practice in primary care setting to apply into clinical practice (ANPC 604) **Spring 2024** - Acquire IRB and UCSD ACQUIRE approval for implementation of evidence-based practice project (DNPC 630)