Improving Quality of Life Through Alternative Treatments for Chronic Low Back Pain Patients:

A quality improvement project

Table of Contents

Title Page 3
Problem Identification 4
Problem Statement and PICO Question 5
Background and Significance 6
Consequences of Chronic Pain 6
Analysis of Cost in the United States 7
Knowledge Gap and Proposed Solution 7
Proposed Project Setting and Population 8
Inclusion and Exclusion Criteria 9
Data from Retrospective Analysis 10
Interprofessional Team and Stakeholders 10
Organizational Needs Assessment/SWOT Analysis 11
Theoretical Framework 12
Literature Synthesis 13
Interventions of Magnesium and Acupuncture 13
Measurement Tool for Retrospective Analysis 15
Project Goal and Objectives 16
The Health Program Implementation 20
Ethical Considerations and Policy Implications 22
Code of Ethics 23
Related AACN DNP Essentials 24
Results from Project Data Collection 25
Discussion of Outcomes Interpretation 27
Dissemination 27
Abstract 27
Conclusion 29
References 30
Appendices 34

Improving Quality of Life Through Alternative Treatments for Chronic Low Back Pain Patients: A quality improvement project

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Wang et al. (2018) found that chronic low back pain (CLBP) was the number one reason patients seek pain relief therapies. CLBP is typically the result of nonspecific or difficult to establish causation, limiting mobility and quality of life for these patients (Brain and Spine Clinic, 2018; John Hopkins Medicine, n.d.; Moley, 2019). Traditionally, Western medicine has treated this condition with opioids or other pharmacological methods (Eshkevari, 2017). Many of these medications have caused adverse reactions or negative side effects, such as fatigue, dizziness, cognitive or motor impairments, building a tolerance to them, depression, addiction, apnea, toxicity, and the possibility of an overdose (Eshkevari, 2017). Recently, some providers have moved away from these practices by implementing new guidelines and researching alternative therapies to alleviate pain, with acupuncture being one of the preferred therapies for chronic pain patients (Centers for Disease Control and Prevention [CDC], 2018).

As Yin Fan et al. (2018) stated, "acupuncture has emerged as a powerful, evidence-based… treatment modality suitable to meeting this need… acupuncture can safely, easily, and cost-effectively be incorporated into hospital settings" (p. 13). In addition, acupuncture has provided adjunct therapy for outpatients taking prescription opioids, with the potential of acupuncture therapy reducing or eliminating the need for these medications (Mehl-Madrona et al., 2016). Another evidence-based supplemental therapy that has demonstrated its effectiveness over decades as an analgesic adjuvant against acute and chronic pain has been magnesium (Mg). Because magnesium has an analgesic effect as an essential mineral, it aids in the recovery process of several chronic diseases (Shin et al., 2020).

This quality improvement project reviewed the effectiveness of acupuncture and magnesium supplementation therapies on CLBP patients and presented the findings in an educational program at a rural clinic to encourage primary providers and staff members to consider these viable treatments when combating this prevalent condition.

Problem Statement

In patients with CLBP, prescribing opioid analgesics for pain management has been the primary treatment in the past. Numerous updated prescribing guidelines have changed this practice and recommend other substantiated treatment modalities as first-line treatments before prescribing opioids. However, many healthcare providers are unaware of the utility and availability of alternative pain management therapies, which creates an enormous gap in care for these patients who continue to suffer under current medical practices. With this in mind, the problem statement for this quality improvement (QI) project was – do rural primary providers, healthcare staff, and patients suffering from CLBP lack the information and knowledge to utilize evidence-based complementary and alternative medicine (CAM) therapies to improve quality of life for this population? The main focus of this project was to educate primary providers, healthcare staff, and local clientele on valid CAM options that are available in managing this condition, alleviating the symptoms, and increasing the patients' quality of life.

The PICO question that addressed this need was: (P) how can *rural healthcare staff and primary providers'* knowledge-base and confidence levels be improved to utilize acupuncture and magnesium supplementation (I) by *implementing an educational program* based on collected data combined with a literature review (C) be compared *to the current status quo of referrals and comfort levels in using CAMs options* (O) in order to *improve the quality of life* for patients 17

years of age and older that suffer from CLBP?

Background and Significance

Chronic pain has reached epidemic proportions worldwide, and every clinician will encounter these patients during their years in practice. Providers have often attributed the pain to disease processes or injury; however, pain may be a condition all by itself (Mills et al., 2019). As Schneiderhan et al. (2017) stated,

> Acute pain is nociceptive pain associated with specific somatosensory stimuli, usually mechanical or inflammatory, and an identifiable peripheral injury or lesion. Acute pain has adaptive value in providing an alert about potential harm… While some acute pain may be persistent or recurring due to the continued presence of a noxious stimulus, the transition to chronic pain is generally defined as occurring at 12 weeks, on the assumption that the offending injury or lesion has healed. The transition to chronic pain involves a shift from peripheral damage and tissue inflammation to more prominent central sensitization and central nervous system mechanisms (p. 2367).

Consequences of Chronic Pain

The effects chronic pain has on a patient extend beyond themselves to their families, the surrounding community, and society as a whole, which has caused an enormous biopsychosocial and financial burden impacting populations worldwide (Tick et al., 2018). Living with the affliction of chronic pain impacts the patient's physical daily functions, which in turn decreases their mobility, causing additional issues to arise, which may include: sadness, depression, anxiety, obesity, worry, anger, reduced quality of life, potential addiction to opioids, and possible suicidal ideations (Tick et al., 2018).

Analysis of Cost in the United States

The number of adults dealing with chronic pain in the United States of America (U. S.) has been estimated to be over 100 million people. This number does not represent active military members, children, nursing home residents, and the incarcerated. Dahlhamer et al. (2018) reported that as a result of "direct medical costs, lost productivity, and disability programs" (p. 1005), the estimated annual cost for pain in the U. S. alone, was approximately $560-635 billion (Tick et al., 2018). Tick et al. (2018) further explained that this astronomical amount exceeded "the annual expenditures for heart disease, cancer and diabetes combined" (p. 179). The populations that reported a higher prevalence of chronic pain were women, adults with lower education levels, people with lower incomes or unemployed, and people with public health insurance (Dahlhamer et al., 2018).

As catastrophic as the cost of treating chronic pain is, these numbers do not compare to the price paid in lives each year, with more than 33,000 Americans dying in 2015 and more than 64,000 in 2016 from opioid overdoses. Amid this opioid epidemic, health organizations worldwide have explored and provided evidence-based, non-pharmacological therapies to benefit those who have suffered from chronic pain (Yin Fan et al., 2018).

Knowledge Gap and Proposed Solution

As previously mentioned, many providers are unaware of the utilization and availability of alternative pain management therapies, which has created a gap in care for these patients who continue to suffer under current medical practices. With this considered, the problem examined was - do rural primary providers, healthcare staff, and patients suffering from CLBP lack the information and knowledge to utilize evidence-based CAM therapies to improve the patient's

quality of life? Therefore, the mission statement for this project was *to improve patient quality of life through complementary and alternative medicines* (CAM). This project aimed to educate healthcare staff and primary providers on the evidence of using magnesium and acupuncture for treatment in these patients to improve their quality of life. The project had two main objectives: the first was to educate local healthcare staff and primary providers with the added knowledge of the available treatments to combat this condition, which may be started in the clinic with the supplementation of magnesium and a referral for acupuncture therapies. Additionally, the information was presented to the patient population that the clinic serves by offering treatment alternatives and exhibiting the benefits of acupuncture for those seeking relief from their CLBP.

Proposed Project Setting and Population

The CAM facility that agreed to assist with data collection and the specific patient population for this project was the acupuncturist Ms. Jean Twomey, from Aitkin Acupuncture LLC., of Aitkin, Minnesota (MN). Ms. Twomey has been practicing in the Aitkin area since moving there in 2016, and she has been receiving referrals from the local clinic, Riverwood Healthcare Center, for pain management and treatment since 2017. Aitkin, MN, is a small, rural town in Central Minnesota with a population of 1,985 as of 2019 (Minnesota Demographics by Cubit, 2021). Aitkin County reported having a population of 15,886 as of 2019 (United States Census Bureau, n.d.). The local healthcare facility hired an outside health contractor to assess the County of Aitkin, and here are the reported findings of the organization of Professional Research Consultants, Inc. (2019) that concluded the demographics of the county consisted of

- 82.8% of people were 17 years of age or older,
- 95% of the population was Caucasian,

- 52% of the population viewed CLBP as a moderate to a major concern in this community, and
- 7.5% of the community surveyed reported being uninsured.

Within these reported demographics, Ms. Twomey was the only acupuncturist in her clinic and served a patient demographic of approximately 85% women, mostly between 35-70 years of age, 12% men, and 3% children. The majority of the patients treated in this practice were Caucasian, with 75-80% covered by insurance and 20-25% of the patients paying out-of-pocket. Many of the patients with insurance had HP or BCBS, and there were about 20% that were Medicaid. Ms. Twomey started diligently utilizing nutritional supplements in her practice in 2018.

Inclusion and Exclusion Criteria

This project included local primary providers of a rural clinic, with pre-and post-surveys to assess their knowledge-base and comfort levels with CAM therapies and referrals. However, the project did not include specialty providers, specifically pain specialists who treat this condition throughout their practice. Moreover, this project initially assessed two subgroups from the acupuncturist's practice in a retrospective analysis: the patient-specific data information for *patients suffering from CLBP that are 17 years of age and older,* who have received either acupuncture therapy only, or a combination of acupuncture therapy and magnesium supplementation to treat their CLBP symptoms. With this in mind, patients treated for acute low back pain, which is defined as three months or less, were not included in this project's analysis. Furthermore, the local clientele was included in the dissemination process of the educational program for this project; however, data from this specific population was not collected. The only

results assessed from the program's implementation were whether there was an increase in the knowledge of CAM and referrals from the rural clinic's staff members. Additional information regarding the privacy and protection of the participating groups is discussed further in the 'The Health Program Implementation' section of this proposal.

Data from Retrospective Analysis

The patients' data reviewed for this project ranged from 17 to 86 years in age. The samples consisted of eight males and twenty-five females. The patients' pain level scores were attained pre-and post-treatment with the Numeric Pain Rating Scale (NPRS) measurement tool discussed later in this paper (see Appendix A). The data were obtained by reviewing the two sample groups of acupuncture-only and acupuncture + Mg supplementation (see Appendix B). The calculations demonstrated an average maximum pain level of 8/10 pre-treatment and a decrease in the average maximum pain level to 5.38/10 post-treatment for the acupuncture-only patients from a sample size of 13, which was a decrease in pain of approximately 33%. The calculations further showed an average maximum pain level of 8.30/10 pre-treatment and a decrease of maximum pain level to an average of 4.20/10 reported in the acupuncture + Mg supplementation post-treatment from a sample size of 20 patients, which was a decrease in pain of approximately 49.4% (see Appendix C). The results from these two groups were further compared, and the additional decrease in pain was determined to be approximately 25% from the acupuncture-only group to the acupuncture + Mg group in post-treatment levels.

Interprofessional Team and Stakeholders

This project was an interprofessional collaboration that included the doctoral student (project leader), supporting faculty advisors, the acupuncturist, the patients participating in the

retrospective analysis of patient-specific data, the rural clinic staff and healthcare providers, as well as the participating community members (the surrounding patient population). These same participants are the stakeholders in and for this project.

Organizational Needs Assessment/SWOT Analysis

Due to the current COVID pandemic and protocols, the project leader could not obtain SWOT analysis information from the initial intended organization. The project leader was previously in contact with HR recruitment in charge of authorizing project implementation; however, information was not divulged or obtained due to COVID measures that were in place. The project leader continued to follow up with the HR recruiter to assess updated protocols in order to implement the intended QI project. With facility restrictions and policies limiting extra personnel on sites, specifically smaller facilities with limited staff, the project leader had difficulty solidifying the local clinic when they were still contending with the pandemic mandates and regulations. With this in mind, this was considered the most significant challenge or barrier faced while attempting to implement and complete this project.

A new project site was obtained during week 10 of the project's implementation (see Appendix D), and pre-surveys were completed during that week. The new site consisted of two primary providers, one of which practices acupuncture for chronic pain conditions, including CLBP, and seven additional healthcare staff. Prior to the project leader presenting the three-minute thesis in week 12, the staff had an opportunity to look at the correlating poster board and brochure information that was set up and displayed during weeks 11 and 12 in the clinic's lobby. The final presentation with the clinic staff and providers was conducted with ample time for questions, concerns, or comments after the presentation concluded, and

post-surveys were collected at the end of week 12 in the project's timeline.

Strengths of the rural clinic where the presentation was conducted included that one of the primary providers utilizes acupuncture in her practice on her patients, including for chronic low back pain. Weaknesses would include that there are only two primary providers at the clinic thus far, and the clinic has only been open since June 2021, so they are a small clinic that is still building in clientele and do not have a large volume of patients at this time. Opportunities for this clinic are that several patients became disenchanted with the current large healthcare organizations and their ridged policies during the pandemic and are looking for a more personable provider concerned about their personal healthcare needs. Threats might include that they are a small clinic, and it has been difficult for small businesses to stay open in this current economic climate.

Theoretical Framework

The QI model chosen for this project is the Plan, Do, Study, Act (PDSA) cycle, which represented the theoretical framework for this paper (Christoff, 2018). The PDSA cycle is a repeating sequence that allows for assessment and improvement based on the evaluation and feedback from each step within the four-step model. The *plan* step was the development phase, which consisted of collecting the data from the retrospective analysis, combining it with the research from the literature review, and completing the pre-surveys to assess the healthcare providers' knowledge-base and comfort levels for utilizing CAM therapies, then determining the intended material that would be needed for the educational program to be presented to clinic staff and community members. This step was where the 'who, what, when, and where' of the plan was deliberated on, which is answered in this paper's 'The Health Program Implementation' section.

The next phase was the *do* stage, where the researched interventions and the collected data were combined to formulate an educational program to increase the healthcare providers' knowledge-base of the benefits of CAM treatments. This phase included producing the poster board presentation, the brochures, a three-minute thesis presentation presented to the clinic staff, and the paper material displayed for the community members upon approval from the healthcare administration. The results from this phase were assessed in the *study* stage of the cycle by conducting pre-and post-surveys with the healthcare staff to determine whether there was an increase in their knowledge-base of the benefits of utilizing CAM treatments. Finally, the interventions can be adapted, modified, or discarded by the local facility in the *act* phase, dependent on the data analysis conducted in the previous step. The information obtained from one cycle influenced the following cycles (Christoff, 2018).

Literature Synthesis

This project progressed by implementing the researched interventions and measurement tools to assess the patient's outcomes in the 'do' phase of the PDSA cycle (Christoff, 2018). The interventions chosen for this project were selected as alternative therapies in the treatment of CLBP because of the evidence found while conducting the literature review (see Appendix E). The measurement tool utilized for this project helped assess the patient's pain levels on a 0-10 pain rating scale during the retrospective analysis of the acupuncturists' patients to determine the severity the CLBP patient experienced prior to and after treatments rendered.

Interventions of Magnesium and Acupuncture

The next phase of this project assessed the suggested interventions that brought the project into the 'study' phase (Christoff, 2018). The interventions aimed to assist local primary providers

in being more cognizant of available alternative options in the treatment of CLBP, which can begin with adding a magnesium supplement to the patient's plan of care, as well as presenting the benefits of acupuncture to this patient population that is seeking relief from their CLBP.

The first analysis to support alternative interventions for CLBP was a primary study focused on Veterans Affairs (VA) populations receiving opiates for long-term treatment of chronic pain. Participants agreed to go through one physician for their medications and one pharmacy so that the authors could track the participants' medications. The intervention included two group medical visits (GMV) a month that was two hours long, including a behavioral health specialist and a family doctor training participants in behavioral health aspects regarding their chronic pain. These sessions continued over six months. During these sessions, part of the interventions included the patients consenting to participate in weekly physical activity, as well as completing some of these activities during the group sessions, which could include yoga, exercise classes, t'ai chi, or qigong, chiropractic therapy, physical therapy, osteopathic treatment, and some of the patients reported obtaining massage and acupuncture therapy as well. The sessions also contained mindfulness techniques, guided imagery, visualization, and exercises to achieve their dialectic behavior therapy goals (Mehl-Madrona et al., 2016). The data from this study demonstrated that alternative therapies could be a practical and positive way to help reduce and even discontinue opioid treatment while decreasing the patients' pain levels.

The subsequent intervention for this project focused on supplementing magnesium as an adjuvant analgesic in treating chronic pain. As Shin et al. (2020) describe, "magnesium has no direct antinociceptive effects, it inhibits calcium ions from entering cells by blocking (*N*-methyl-D-aspartate) NMDA receptors, resulting in an analgesic effect. This analgesic effect is

related to the prevention of central sensitization caused by peripheral tissue injury" (p. 1). This review explored numerous clinical studies conducted on various pain conditions and management. Unfortunately, the data obtained in these studies were inconsistent across the board, and the authors attribute this to possible improper formulation or dosage administrations. However, the authors acknowledge the indirect role magnesium plays in the prophylaxis management and treatment of various pain conditions and diseases, including chronic pain (Shin et al., 2020).

The final analysis was a comprehensive assembly of evidence-based sources (randomized control trials, meta-analyses, Cochrane systematic reviews, etc.), which discussed conditions that have been successfully treated with non-pharmacologic treatments, that included the use of acupuncture as a valid option, either solely or as an adjunct treatment and the therapy was shown to be effective with these conditions (Yin Fan et al., 2018). This review is a 'go-to' guide for many treatment options that do not involve prescription medications. By encouraging patients to initiate self-care treatment options and contribute to their health and well-being, as providers, we are advocating for them to be active participants in the outcomes of their quality of life and chronic pain management.

Measurements Tool for Retrospective Analysis

The interventions for this project must have a measurement to quantify the validity of the retrospective analysis. With this in mind, several tools were researched to assess the severity of the patients' pain levels prior to and after therapies when conducting this portion of the project with acupuncture patients and the impact that CLBP has had on their quality of life.

The assessment tool for this project was the NPRS measurement tool for patients with low

back pain (Childs et al., 2005). This tool was tested initially in a cohort study completed with patients experiencing low back pain. The tool was developed as a self-report measurement of characteristics in pain that were assessed on an 11-point scale from 0-10 with 0='No Pain', and 10='Worst Imaginable Pain'. The participants rated their pain at current, best, and worst levels over the past 24 hours. The average was taken from three ratings and used to represent the patient's overall pain intensities, and these scores were assessed at baseline, a 1-week, and a 4-week follow-up (Childs et al., 2005). This tool was helpful in this project because it was simple to measure the NPRS at the baseline and the outcomes of the patients in the retrospective analysis.

Project Goal and Objectives

Health Program Goal

The health program's goals for this QI project were to increase the healthcare staff and providers' knowledge of CAM options and present the collected evidence of benefits to the local patient population suffering from CLBP to improve the patient's quality of life.

Objective 1

Gathered patient-specific data of local CLBP patients that rated their pain scores on a scale from 0-10 to form two sample groups that have either utilized acupuncture or acupuncture in conjunction with magnesium supplementation to display this data to healthcare providers in the intended educational program.

Outcome Measure and Evaluation

This outcome was nominally met by the *end of week 2* (see Appendix F). It was met once the review produced at least ten patients who had completed a series of treatments (*full round*

varied per patient) of only acupuncture therapy and an additional sample of ten patients that completed a series of treatments using magnesium supplementation in conjunction with acupuncture. The sample sizes for the two groups resulted in thirteen patients for the acupuncture-only group and twenty patients for the acupuncture + Mg group.

Objective 2

Analysis of the collected data from the two treatment groups was assessed and compared for whether the treatment options were beneficial in reducing pain levels and whether there was a notable difference in the outcomes of these patient populations.

Outcome Measure and Evaluation

The acupuncturist and project leader recorded the pain scores from before and after treatments of CLBP patients to determine whether the CAMs were beneficial in reducing pain levels and assessing the variability in the reduction of pain between the acupuncture-only and the acupuncture and magnesium supplementation group. The acupuncturist redacted all personal health information (PHI) to provide privacy and protection for these patients. This outcome was nominally met by the end of week 3 (see Appendix F).

Data Analysis

Once the data was collected from these patients' files, it was placed into the Intellectus Statistics website to analyze the descriptive statistics to verify the stats variables, frequencies, percentages, standard deviations, and means that helped to identify pertinent findings and sculpt the educational information and intended presentation for this project.

Objective 3

Analyzed the local providers' baseline knowledge of CAM treatment options, their

experience and comfort levels in utilizing CAMs in their practices with a survey conducted before implementing the educational program.

This survey was distributed to providers and staff of the local clinic to receive at least five completed surveys before implementing the educational program. The purpose of conducting the pre-survey was to obtain the healthcare staff's experience and baseline knowledge results to incorporate the needed gap analysis information into the educational presentation.

Outcome Measure and Evaluation

This objective would be nominally met by the end of week 4 (see Appendix F), with at least 50% of the surveys completed. The doctoral student communicated with the local clinic administrative team member at the initial presentation site to assess the willingness and readiness of the primary providers to participate and complete this QI project's survey and intended educational program. However, this site was canceled due to pandemic protocols. Another site was obtained in week 10 of the project's timeline. Pre-surveys were distributed, and 100% of the surveys were returned from the nine staff members working at the second clinic.

Objective 4

Developed an educational program to help increase the healthcare providers' knowledge of the benefits of CAM therapies and inform the local community of treatment options other than prescription medications for CLBP patients. Created an educational program synthesized from the patient data collected, the literature review conducted on selected interventions, and from the results of the local providers' baseline knowledge on CAMs. The doctoral student corresponded with the acupuncturist and academic advisor to help 'fine-tune' the compiled information.

Outcome Measure and Evaluation

The educational program was in the process of being developed *during weeks 5-8*. The three-minute-thesis (3MT) was also utilized in the educational presentation to the staff and was completed in week 10 of the project's timeline. This outcome was nominally met by the *end of week 11 due to finalizing the 3MT*.

Objective 5

Implementation and dissemination of the findings from the analysis and synthesis of the comprehensive data obtained will be conducted at the local clinic *during weeks 9 and 10* (Issel, 2018). This portion of the project will be the educational program presented at the local clinic to the healthcare providers and staff, and a poster board presentation will be displayed in the clinic's lobby with brochures for community members to read and take at their convenience.

Outcome Measure and Evaluation

This project's implementation and dissemination did not begin until *weeks 11 and 12 due to the project's location change.* The project leader presented the gathered data to the clinic staff as a 3MT presentation at a selected time during week 12, once permission was granted from clinic administration and providers. This outcome was met nominally at the end of week 12. (The educational information will consist of a PowerPoint presentation for the project leader's cohort and academic faculty advisors.)

Objective 6

Assessed the effectiveness of the educational program on the local staff and providers' knowledge and comfort levels in recommending CAM therapies by administering a post-survey. The survey will be distributed to the participating staff after the brochure, poster board, and 3MT

presentation have been conducted to determine any alterations in the providers' perception or attitudes towards recommending patients to CAM therapies (Issel, 2018).

Outcome Measure and Evaluation

This objective was statistically met when at least 88% (8 out of 9) of the surveys were completed or nominally met by collecting the completed surveys and calculating the results by the end of *week 12*. The results from the surveys were analyzed to help determine the effectiveness of the implemented educational program and to assess whether there was an increase in the providers' knowledge of CAM treatment options (see Appendix F). The analysis consisted of pre-and post-survey results with a paired t-test and Likert scale. Results from these surveys are discussed further in the 'Results from Project Data Collection' section.

The Health Program Implementation

The health program for this QI project was a compilation of the methodology, work plan, and data collection with analysis combined into the implementation of the project and has been discussed throughout this paper, as well as consisting of the three defined phases that evolved to develop an educational program (see Appendix G). The first phase was a retrospective analysis of patient-specific data from the participating acupuncturist of patients suffering from CLBP who completed a round of acupuncture treatments alone (*full round varied per patient*) or acupuncture and magnesium supplementation combined. The second phase of the project entailed synthesizing the collected data and blending it with evidence-based literature reviewed material on CAMs and conducting a providers' survey to assess the current knowledge and comfort level of utilizing CAMs in their practices with CLBP patients. This information was formulated into an educational program on the benefits of CAMs to present to the local clinicians and patients in

a primary clinic. The third phase was the implementation and dissemination of the data as a poster presentation and educational brochure in the clinic reception area to increase the knowledge of CAMs for providers and patients alike, with the specific aim of this QI project to improve the quality of life for patients suffering from CLBP by utilizing CAMs (Shin et al., 2020; Mehl-Madrona et al., 2016; Yin Fan et al., 2018).

This project was conducted over three months. Several of the objectives previously discussed were conducted simultaneously within the timeframe for this QI project (see Appendix H). Unfortunately, with the change in location of the project, the pre-survey and start of implementation were delayed past the predicted timeframe initially laid out. The project's first two weeks consisted of *gathering patient-specific data* with the local acupuncturist for the educational program to exhibit the benefits of CAMs coming from local patients. *Analysis of the patient data* was completed while gathering the information; however, the deadline for completing the analysis was at the end of week three. The second month of this project was occupied with developing the educational program based on the compilation of the patient data, the literature review on CAMs, and obtaining a location to conduct and complete the project. The *analysis of the local providers' knowledge and comfort level of CAMs* (see Appendix I) was originally planned to take place in the first month of this QI project (with the location change, this occurred later than anticipated). The results were supposed to be tallied by the end of week four but were conducted in week ten once the location was confirmed to assist the project leader in understanding the healthcare staff and providers' experience and comfort level in recommending patients with CLBP for CAM options. The educational program was completed by week eight of this QI project. During the eleventh and twelfth weeks of the project, the

researched data was *implemented and disseminated as an educational presentation* on a poster board with brochures, and eventually, a 3MT was presented to the staff. Finally, the doctoral student *assessed the effectiveness* of the educational program by distributing the 'follow-up' survey (see Appendix J) on completion of the 3MT in the twelfth week (with a final collection of surveys at the end of the twelfth week), concluding the QI project at the end of the third month. Due to the project being led and conducted solely by the doctoral student, the budget for this QI project was minimal and consisted of purchasing supplies for the poster board and brochure presentations, and any other expenses were not foreseen or occurred at the end of the twelfth week.

Ethical Considerations and Policy Implications

The ethical considerations for this QI project were held to the utmost standards, and the student coordinator did not take the privacy of the participating patients, providers, local clinic, or community members (all of whom are stakeholders in this project) lightly. It was and is the responsibility of the doctoral student to ensure that protection measures were in place in every phase of this health program. With this in mind, the program's first phase was identified as the highest risk for possible privacy violations while gathering and analyzing the patient-specific information to assess the effectiveness of completed CAM treatments. However, the doctoral student and acupuncturist communicated that no identifying personal health information (PHI) was shared in gathering the needed data for the educational program. The data that is used for this project is: whether the person had CLBP, whether they completed an entire series *(varied per patient)* of visits for acupuncture if they were taking a magnesium supplement in combination with acupuncture, and what the patients' pain scores were before and after administration of

treatments. Therefore, the Health Insurance Portability and Accountability Act (HIPAA) and The Privacy Rule as per 45 CFR were not infringed upon throughout this health program (Health Information Privacy, 2020; Office for Human Research Protections, 2021).

Furthermore, in the second phase of the program, there was a certain number of surveys given to the clinic (9 surveys), and the percentage of surveys completed and returned to the project coordinator was how the student assessed the healthcare staff and providers' baseline and post-program knowledge and comfort levels of using CAM therapies. The primary purpose of the pre-and post-program surveys was to measure the effectiveness of the educational program on whether there was an increase in knowledge and use of CAMs in their practice, and the results from the participating staff were anonymous. Additionally, as healthcare providers, employees are encouraged to participate in QI and educational projects with evidence-based therapies to help improve patient outcomes. The specific results from these surveys were not shared publicly with other providers or the local community. Thus, the providers did not need informed consent for this portion of the QI project (Issel, 2018).

Ultimately, the policy implications for this project were to initially 'shed light' on the benefits of utilizing CAMs for patients suffering from CLBP as a valid option and hopefully assist healthcare staff in recognizing CAM more readily as first-line treatments for this patient population. With this recognition from the healthcare providers and staff, the doctoral student hoped this would evolve into a change in guidelines and policies for the clinic's initiation of treatment and referral process for CLBP patients.

Code of Ethics

When developing health programs, ethics should be a top priority to consider regarding

the participants and the project's overall outcome. The provision that correlates most closely to the implementation of this project was provision seven of the American Nurses Association (ANA) Code of Ethics which stated, "The nurse, in all roles and settings, advances the profession through research and scholarly inquiry, professional standards development, and the generation of both nursing and health policy" (ANA, 2015). This provision was chosen due to the nature of QI projects initiating scholarly inquiry and research that develops into changes for health policies and nursing practices as a whole.

The other provisions that aligned with the project coordinator's vision of advanced practice registered nurses (APRNs) and the implementation of this health program were provisions one and three. Provision one of the ANA Code of Ethics stated, "The nurse practices with compassion and respect for the inherent dignity, worth, and unique attributes of every person" (ANA, 2015). This provision helps to remind APRNs/primary providers alike that these principles and values are at the forefront of why we strive to improve our health delivery services, seek CAM treatment options, and advance the quality of care for our patients.

Finally, the third provision stated, "The nurse promotes, advocates for, and protects the rights, health, and safety of the patient" (ANA, 2015). This health program advocated for patients suffering from CLBP that may have otherwise received treatment in the past that was not beneficial for them and their quality of life. Along with promoting and advocating for this patient population, the patients' rights, safety, and health were protected because of how the project was conducted.

Related AACN DNP Essentials

Additionally, this project aligned with several of the American Association of Colleges of

Nursing (AACN) DNP Essential Domains (2021). The first domain this QI project correlated with is Domain 1 - Knowledge for Nursing Practice. This project aligned with this essential because the project applies theory, research-based knowledge of CAMs, and clinical judgment to the planning and implementation process and integrates this knowledge from other disciplines.

The next DNP essential this project supported is Domain 2 - Person-Centered Care. The project focused on improving the quality of life for CLBP patients by educating rural primary providers on CAM treatments to treat patients holistically.

Furthermore, the project concentrated on Domain 4 - Scholarship for the Nursing Discipline. This essential is utilized by generating, applying, and disseminating evidence-based knowledge to transform healthcare and improve the quality of life for these patients.

Finally, the last essential this project applied was Domain 6 - Interprofessional Partnerships. The project leader collaborated with faculty members, stakeholders (primary providers and community members), and healthcare professionals (licensed acupuncturist) involved throughout the entirety of this QI project.

Results from Project Data Collection

A two-tailed paired samples *t*-test was conducted to examine whether the mean difference in comfort levels for recommending CAM pre-survey and post-survey was significantly different from zero (Intellectus Statistics, 2021).

Results

The two-tailed paired samples *t*-test was significantly based on an alpha value of .05, $t(7) = -2.39$, $p = .048$, indicating the null hypothesis can be rejected. This finding suggests that the mean comfort levels for recommending CAM pre-survey and post-survey were significantly

different from zero. The mean comfort levels for recommending CAM pre-survey were significantly lower at 4.25, rather than the mean post-survey results at 5. The results are presented in Table 1. A bar plot of the means is presented in Figure 1, and results of the Likert scale from the pre- (9 participants) and post-survey (8 participants) are displayed in Appendix K.

Table 1

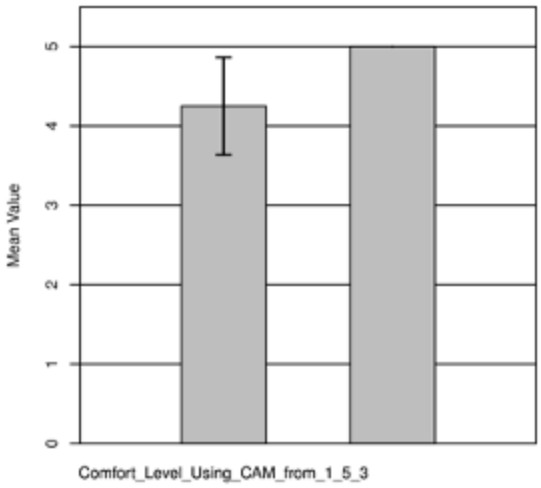
Two-Tailed Paired Samples t-Test for the Difference Between Comfort Levels for Recommending CAM Pre-Survey and Post-Survey

Comfort Levels for Recommending CAM Pre-Survey		Comfort Levels for Recommending CAM Post-Survey				
M	*SD*	*M*	*SD*	*t*	*p*	*d*
4.25	0.89	5.00	0.00	-2.39	.048	0.85

Note. N = 8. Degrees of Freedom for the *t*-statistic = 7. *d* represents Cohen's *d*.

Figure 1

The means of Comfort Levels for Recommending CAM Pre-Survey and Post-Survey with 95.00% CI Error Bars



Discussion of Outcomes Interpretation

Reviewing the results from the pre-and post-survey answers, there is a positive increase in comfort levels on the Likert scale from the healthcare staff and providers in recommending CAM therapies to patients suffering from CLBP. The answers provided by the staff in the surveys additionally suggest that the poster board presentation, brochures, and 3MT increased the staff and providers' knowledge on utilizing the recommended treatment and supplementation options for this patient population (see Appendix L).

Dissemination

This project information was disseminated in weeks 11 and 12 of the intended timeline via a poster board, brochure, and 3MT presentation to the clinic staff and providers. All staff gave positive feedback on the presentation. Ample time was given for questions and answers to the topics covered. The post-surveys were distributed and collected anonymously once there were no further questions about the data analysis and researched interventions. The project's goals and objectives were met by collecting more than 50% of the surveys provided, and a positive correlation of an increase in knowledge and comfort levels for recommending CAM therapies was obtained. No feedback was provided for improving the project's implementation or dissemination process; only positive feedback was given.

Abstract

Improving Quality of Life Through Alternative Treatments for Chronic Low Back Pain Patients: A quality improvement project

Teresa Jones

Nature and scope: Chronic low back pain (CLBP) is why patients seek pain relief therapies (Wang et al., 2018). Treatment for this condition has been opioids in the past (Eshkevari, 2017). The problem examined is whether rural healthcare providers lack the information and knowledge to utilize evidence-based CAM to improve this population's quality of life? This project aimed to improve local healthcare providers' knowledge of CAM options and present the benefits of CAM to the rural patient population.

Synthesis and analysis: The framework applied to this project was the Plan, Do, Study, Act (PDSA) cycle. The interventions utilized were Mg supplementation and acupuncture. The data collected from the retrospective analysis supported the implementation of Mg supplementation from primary providers in conjunction with referrals for acupuncture treatments to decrease CLBP. The measurement tool used to assess pain levels before and after treatments was the Numeric Pain Rating Scale (NRPS), which rated pain from 0-10.

Project implementation/Challenges: The implementation process included six objectives: **1**) Gather Patient-Specific Data, **2**) Analyze Patient Data, **3)** Analyze Providers' Knowledge of CAM, **4)** Develop Educational Program, **5**) Implement Educational Program, and **6**) Assess Effectiveness Among Providers. The challenge was changing the original dissemination site due to COVID; another site was obtained.

Evaluation criteria: The effectiveness of the educational program among healthcare providers by conducting a post-survey to determine an increase in knowledge of CAM treatments and their comfort levels of utilizing these interventions.

Outcomes: Outcomes were met with *>80% of surveyed healthcare providers reporting an increase* in knowledge and comfort levels measured as a mean of 4.25 pre-presentation, increasing to a mean of 5 post-presentation.

Recommendations: Increase referrals to a local acupuncturist/primary provider and initiate treatment of Mg by the primary providers in practice to decrease pain levels and increase the quality of life for these patients.

Conclusion

In summary, this QI project reviewed the extent of the problem being investigated, examined the gap in healthcare providers' knowledge-base and practices, explored the costs and consequences of the problem and past treatments, and offered the alternative therapies of acupuncture and magnesium supplementation as valid options for treatment of patients that suffer from CLBP.

The project progressed forward with the data collection of local patient-specific information obtained with the assistance of a licensed acupuncturist. The gathered information and the literature review on these effective treatment modalities exhibited a significant decrease in pain with the utilization of Mg + acupuncture for CLBP patients, and this data was adapted into an educational program that focused on increasing healthcare staff and primary providers' knowledge of CAMs and presented these added benefits to the local rural patients who suffer from this condition. These findings can aid this patient population, which can begin with the clinic visits to the primary providers who can start with magnesium supplementation in their practices, along with a referral to the local acupuncturist (in this case, the primary provider) to help in reducing CLBP and *Improving the Quality of Life* for these patients.

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Appendix A

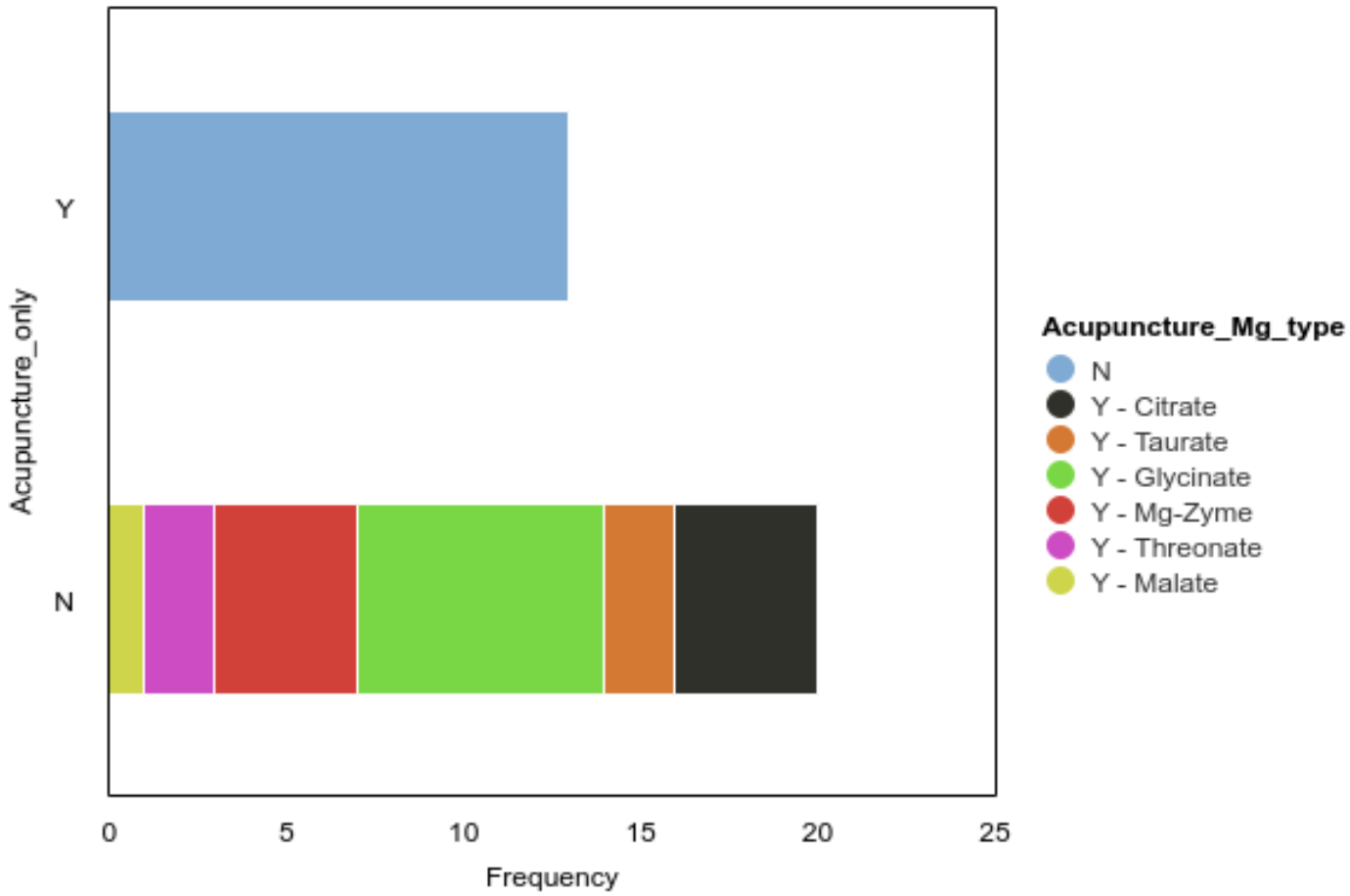
Retrospective Acupuncture Patient Data

Gender	Age	Number of Visits	Initial Pain Score Min. out of 10	Initial Pain Score Max. out of 10	Re-Exam Pain Score Min. out of 10	Re-Exam Pain Score Max. out of 10	Acupuncture	Acupuncture + Mg	Magnesium type
Female	65	19	5	10	2	3	Y	N	
Female	55	17	0	5	0	4	Y	N	
Male	49	8	3	8	2	4	Y	N	
Female	55	11	0	8	0	7	Y	N	
Female	48	10	2	9	2	9	Y	N	
Female	33	23	1	5	0	3	Y	N	
Female	45	50	1	8	0	3	Y	N	
Male	67	57	4	9	0	6	Y	N	
Female	44	40	3	10	3	7	Y	N	
Female	61	13	4	8	4	8	Y	N	
Female	53	51	2	8	2	8	Y	N	
Male	52	16	2	9	2	6	Y	N	
Male	72	10	1	7	1	2	Y	N	
Female	77	47	1	6	0	3	N	Y	Citrate
Male	86	8	0	8	0	5	N	Y	Citrate
Male	84	7	0	10	0	5	N	Y	Citrate
Male	64	15	6	9	4	9	N	Y	Citrate
Female	29	29	1	7	0	5	N	Y	Glycinate
Female	62	5	3	9	1	3	N	Y	Glycinate
Female	33	39	1	10	0	6	N	Y	Glycinate

Female	39	48	0	5	0	2	N	Y	Glycinate
Female	54	18	3	9	0	3	N	Y	Glycinate
Female	42	27	1	8	0	6	N	Y	Glycinate
Female	63	13	7	10	2	4	N	Y	Glycinate
Female	61	14	0	9	0	2	N	Y	Malate
Female	48	36	3	9	3	6	N	Y	Mg-Zyme
Female	63	15	0	10	0	3	N	Y	Mg-Zyme
Female	55	109	4	9	1	2	N	Y	Mg-Zyme
Female	70	10	2	8	2	4	N	Y	Mg-Zyme
Female	67	17	3	10	2	8	N	Y	Taurate
Female	64	5	2	9	0	3	N	Y	Taurate
Female	17	9	0	5	0	2	N	Y	Threonate
Male	44	24	3	6	0	3	N	Y	Threonate

Appendix B

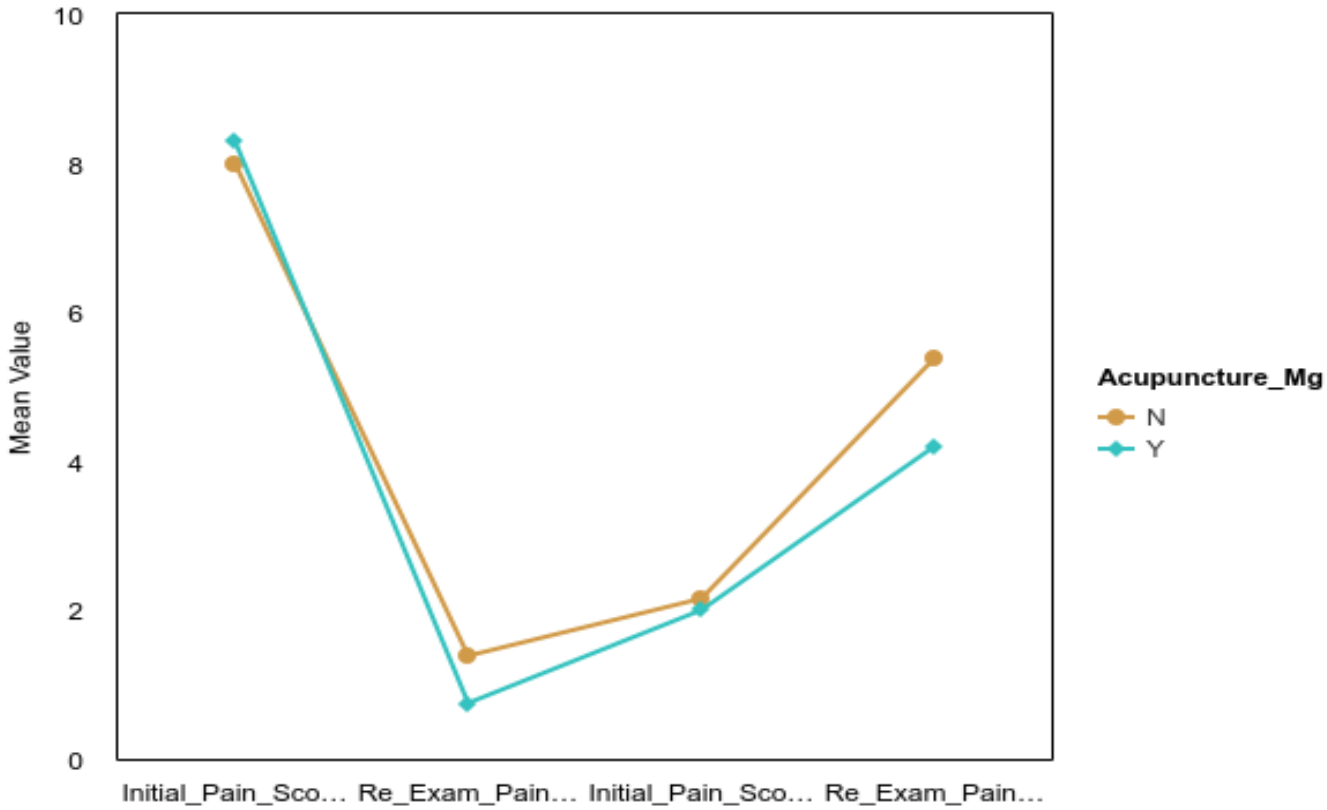
Barplot of Acupuncture_only by Acupuncture_Mg_type Sample Sizes



(Sample Sizes - Acupuncture = 13; Acupuncture + Mg. = 20)

Appendix C

Profile Plot of Acupuncture only and Acupuncture+Mg



(Orange = Acupuncture; Teal = Acupuncture+Mg
– 4 points of NPRS =
1st = max. pre-treatment,
2nd = min. post-treatment,
3rd = min. pre-treatment,
4th = max. post-treatment)

Appendix D

THE COLLEGE OF ST. SCHOLASTICA SCHOOL OF NURSING
Department of Graduate Nursing
DNP Project Approval Form

DNP Project Plan Approval Prior To IRB & Implementation

Student (s):
Name: Teresa Jones
Signature: Teresa Jones
Date: 3/29/2022

Proposed Project Topic: Improving Quality of Life Through Alternative Treatments for Chronic Low Back Pain Patients: QI project

The following have agreed to serve on the DNP Project Team for the above student (please print):

DNP Project Chair
Name and Credentials: Melissa Skoff, DNP, APRN, FNP
Signature: Melissa Skoff
Date: April 6, 2022

DNP Project Practice Mentor or "Expert in the Field" for policy projects & Organization/Agency (letter or email attachment is acceptable)

X Name and Credentials of Mentor: Kristin M Lelcum
Agency: NSFM
Signature:
Date: 3/29/2022

***Submit the completed form to your project course and attach a copy to the IRB application.

The College of St. Scholastica

Institutional Review Board

DATE:	November 21, 2021
TO:	Teresa Jones and [*Dr. Melissa Skoff*]
FROM:	The College of St. Scholastica, Institutional Review Board
RE:	Improving Quality of Life Through Alternative Treatments for Chronic Low Back Pain Patients: A quality improvement project
SUBMISSION TYPE:	New Project
ACTION:	NOT RESEARCH
REVIEW TYPE:	Expedited Review

Thank you for your submission of materials for your project. The College of St. Scholastica Institutional Review Board has reviewed your application and determined that the proposed activity does not meet the definition of research under the Code of Federal Regulations 45 Part 46.102 provided by the Department of Health and Human Services. As such, your project does not require ongoing review or approval from The College of St. Scholastica Institutional Review Board. We will retain a copy of this correspondence within our records.

Any modification to your project procedures that could change the determination of "not research" must be submitted to the IRB before implementation.

When your project is complete, submit a protocol closure form by following these steps: (1) log in to your project in IRBNet, then create a new package (not project), (2) download the protocol closure form from the Forms and Templates menu, (3) complete, sign and submit the protocol closure form.

If you have any questions, please contact Nicole Nowak through the project email function in IRBNet or nnowaksaenz@css.edu. Please include your study title and reference number in all correspondence with the IRB office.

Best regards,

Nicole T. Nowak

Nicole T. Nowak, Ph.D.
Chair, Institutional Review Board

Appendix E

Analysis and synthesis of literature review

Reference	Purpose/ Question	Design	Sample	Intervention	Results	Notes
Childs, J. D., Piva, S. R., & Fritz, J. M. (2005). Responsiveness of the numeric pain rating scale in patients with low back pain. *SPINE, 30*(11), 1331-1334. https://doi.org/10.1097/01.brs.0000164099.92112.29 United States Primary Source (Rush University Medical Center Library, 2021).	The purpose of this study was to investigate the responsiveness of the numerical pain rating scale (NPRS) on patients with low back pain that were completing physical therapy	Cohort Study completed with patients experiencing low back pain.	The sample size started as 131 patients that completed the baseline assessment. 125 completed the 1-week follow-up assessment, and then 119 completed the 4-week follow-up assessment.	The intervention as a self-report measurement of characteristics of pain being assessed on an 11-point scale from 0-10 with 0=No Pain, and 10=Worst Imaginable Pain. The participants rated their pain at current, best, and worst levels over the last 24 hours. The average of 3 ratings were used to represent the patient's overall pain intensities and these were assessed at baseline, 1-week, and 4-week follow-ups.	At the 1-week assessment there were 81 out of the 125 patients that were classified as have improved and 41 classified as stable. At the 4-week follow-up there were 98 out of the 119 patients that were classified as improved and 16 were classified as stable. The authors clarify that due to the small number of patients that worsened at the 1-week and 4-week follow-ups, their characteristics	This study is being utilized for the measurement tool of the NPRS in order to measure the baseline and outcomes of the patients in the project

					were not reported.	
Mehl-Madrona, L., Mainguy, B., & Plummer, J. (2016). Integration of complementary and alternative medicine therapies into primary-care pain management for opiate reduction in a rural setting. *Journal of Alternative & Complementary Medicine, 22,* 621-626. https://doi.org/10.1089/acm.2015.0212 Rural New England Primary Source (Rush University Medical Center Library, 2021).	The purpose of the study was to assess the effects of complementary alternative medicine (CAM), as well as an educational program in group medical visit (GMV) settings two times a month.	The study focused on a VA population that were receiving opiates for long-term treatment of chronic pain.	Initially there were 228 patients enrolled in the comparison groups, however, there were several participants that dropped out throughout the study.	Participants had to agree to going through the same physicians for medications and the same pharmacy, so the authors could keep track of the participants medications. The intervention included the 2 GMV a month that were 2 hours long with behavioral health specialist and a family doctor training in behavioral health. These sessions would continue over a 6-month period of time. During these sessions, part of the interventions consisted of the	Due to staff turnover, the longevity of the study, and the high dropout rate because of the perceived stringent stipulations placed on the participants in the beginning with alternating staff, the sample at the end of the study was much less than the authors had originally hoped for. However, with the remaining sample size the authors suggested that CAM interventions in group settings that are utilized could be effective when introducing	The data obtained in this study is beneficial to the project because it helps to exhibit that alternative therapies can be a practical and positive way to assist in reducing opioid use.

				patients agreeing to participate in weekly physical activity, as well as completing some of these activities during the group sessions, which could include yoga, exercise classes, t'ai chi, or qigong, chiropractic therapy, physical therapy, and osteopathic treatment. The sessions would also contain mindfulness techniques, guided imagery, or visualization, and exercises in achieving their goals of dialectic behavior therapy.	the patients to healing practices and techniques that address their emotional connections to pain as well and far outrank a 15-minute visit with a primary provider for relieving chronic pain in this patient population.	
Mills, S. E. E., Nicolson, K. P., & Smith, B. H. (2019).	This review is a narrative synthesis of chronic pain,	Narrative Review of	Sample size: N/A	N/A	No statistical analysis was presented in this	This review is being used to highlight the significance and

Chronic pain: a review of its epidemiology and associated factors in population-based studies. *British Journal of Anaesthesia, 123,* e273-e283. https://doi.org/10.1016/j.bja.2019.03.023 United Kingdom Secondary Source (Rush University Medical Center Library, 2021).	common risk factors, the epidemiology of, and demographics associated with chronic pain from within population-based studies	Population-based studies	Inclusion: Studies that examined and exhibited associations between cultural, socio-economic, psychological, biological, or other risk factors which affected development, persistence, or severity of chronic pain. No dates, study design or country was excluded. Exclusion: Studies or Articles not published in English, and if full text was unavailable.		article; however, the findings indicate the weight of chronic pain is felt around the world, and is not only limited to certain regions. Risk factors, causes, and the effects that chronic pain have on all aspects of a person's life and a society as a whole is a burden shared globally. More studies and effort can and should be placed on prevention, diagnostic techniques, and treatment options in order to help serve patients dealing with chronic pain achieve their optimal health goals.	background information of the effects that chronic pain has in the United States.

Tick, H., Nielsen, A., Pelletier, K. R., Bonakdar, R., Simmons, S., Glick, R., Ratner, E., Lemmon, R. L., Wayne, P., & Zador, V. (2018). Evidence-based nonpharmacologic strategies for comprehensive pain care: The consortium pain task force white paper. *Explore: The Journal of Science & Healing*, *14*, 177-211. https://doi.org/10.1016/j.explore.2018.02.001 United States Secondary Source (Rush University Medical Center Library, 2021).	The purpose of this research is just as the title states, "Evidence-based nonpharmacologic strategies for comprehensive pain care"	Comprehensive research from various randomized trials and systematic reviews that support the use of nonpharmacologic strategies being used for the management of pain. Acupuncture is one of the therapies that is discussed on pages 190-191 effectively used for chronic low back pain.	N/A	Acupuncture, along with many other nonpharmacologic treatments that have proven to be effective with varying conditions.	The evidence demonstrates that acupuncture has been shown to be beneficial in the treatment of chronic low back pain.	The data directly validates that acupuncture therapy can be useful in treating several conditions, and as such, may be utilized as an intervention for this project in providing a decrease in pain levels and an increase in physical functioning levels.
Wang, H., Yang, G., Wang, S., Zheng, X., Zhang, W., & Li, Y.	The purpose of this survey was to gather informational data	This was a cross-sectional study that was	The sample size consisted of 430 acupuncturists	The survey included nine questions both in	Wang et al. (2018) stated, "pain represented	The authors were concise with their questions, however,

(2018). The most commonly treated acupuncture indications in the united states: A cross-sectional study. *American Journal of Chinese Medicine*, *46*(7), 1387–1419. https://doi.org/10.1142/S0192415X18500738 United States Primary Source (Rush University Medical Center Library, 2021).	from around the country to examine the most commonly treated conditions with acupuncture and analyze the acupuncturists' characteristics that determine the indication distributions.	conducted nation-wide in a survey/ questionnaire format that was completed by the practitioners/ acupuncturists	initially, however, only 419 of the surveys were completed all the way. The analysis is taken from this sample size.	English and in Chinese. The questionnaire was sent to practitioners that had practiced for three or more years. From the nine questions, three were demographic questions geared towards the practitioner. Three questions pertained to their training, education (where they were educated and trained – U.S. or China), and their practice (how many years of experience and which state they work in). Then there were two questions exploring the most frequently treated	the largest category of common acupuncture indications in our top-99 indication analysis" (p. 1404) Additionally in the pain category, low back pain was ranked as the most frequently treated disorder. "Chronic lower back pain… could be effectively alleviated by acupuncture and other non-pharmacological therapies" (p. 1404) was the conclusion of this cross-sectional study.	extremely thorough with their data collection and analyzation from the answers they received. The report was laid out in a comprehensive manner and they exhibited knowledge of the various types of trained practitioners, whether they were U.S. or Chinese trained and their scope of practice.

				indications for acupuncture treatments (pain, gastrointestinal issues, immune, mental health, etc.), and from those indications, what were the top indications for treatment in those categories (depression, insomnia, low back pain, anxiety etc.) The last question was optional for receiving a gift.		
Yin Fan, A., Miller, D. W., Bolash, B., Bauer, M., McDonald, J., Faggert, S., He, H., Ming Li, Y., Matecki, A., Camardella, L., Koppelman, M. H., Stone, J. A. M., Meade, L., & Pang, J. (2018).	This review was/is a comprehensive assembly of randomized control trials, meta-analyses, Cochrane systematic reviews, etc., discussing conditions that have been successfully treated with non-pharmacologic	Compilation of randomized control trials, Cochrane systematic reviews, meta-analyses, systematic reviews, etc. – White Paper for evidence-based	N/A	The review discusses treatment with massage therapy, mindfulness, imagery, acupuncture, virtual reality assisted distraction, spinal manipulation, meditation/	The results are compiled in narrative format for each individual section, demonstrating the evidence the review board found for each therapy/treatment option.	This review is a "go-to" guide for many of the treatment options that do not involve prescription medications. By encouraging patients to initiate self-care treatment options and contribute to their health and

Acupuncture's role in solving the opioid epidemic: Evidence, cost-effectiveness, and care availability for acupuncture as a primary, non-pharmacologic method for pain relief and management - white paper 2017. *Meridians: The Journal of Acupuncture & Oriental Medicine*, *5*(1), 13–52. https://doi.org/10.1016/S2095-4964(17)60378-9 United States Secondary Source (Rush University Medical Center Library, 2021).	treatments, including the use of acupuncture, either solely or as an adjunct treatment and it has shown to be effective with these conditions.	non-pharmacologic strategies		relaxation therapies, biofeedback, movement therapies – yoga, Pilates, tai chi, and other techniques, as well as nutrition and lifestyle factors that can contribute to the effects of pain.		wellbeing, as providers, we are advocating for them to be an active participator in the outcomes of their quality of life.

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Mehl-Madrona, L., Mainguy, B., & Plummer, J. (2016). Integration of complementary and alternative medicine therapies into primary-care pain management for opiate reduction in a rural setting. *Journal of Alternative & Complementary Medicine, 22,* 621-626. https://doi.org/10.1089/acm.2015.0212

Mills, S. E. E., Nicolson, K. P., & Smith, B. H. (2019). Chronic pain: a review of its epidemiology and associated factors in population-based studies. *British Journal of Anaesthesia, 123,* e273-e283. https://doi.org/10.1016/j.bja.2019.03.023

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Tick, H., Nielsen, A., Pelletier, K. R., Bonakdar, R., Simmons, S., Glick, R., Ratner, E., Lemmon, R. L., Wayne, P., & Zador, V. (2018). Evidence-based nonpharmacologic strategies for comprehensive pain care: The consortium pain task force white paper. *Explore: The Journal of Science & Healing*, *14*, 177-211. https://doi.org/10.1016/j.explore.2018.02.001

Wang, H., Yang, G., Wang, S., Zheng, X., Zhang, W., & Li, Y. (2018). The most commonly treated acupuncture indications in the United States: A cross-sectional study. *American Journal of Chinese Medicine*, *46*(7), 1387–1419. https://doi.org/10.1142/S0192415X18500738

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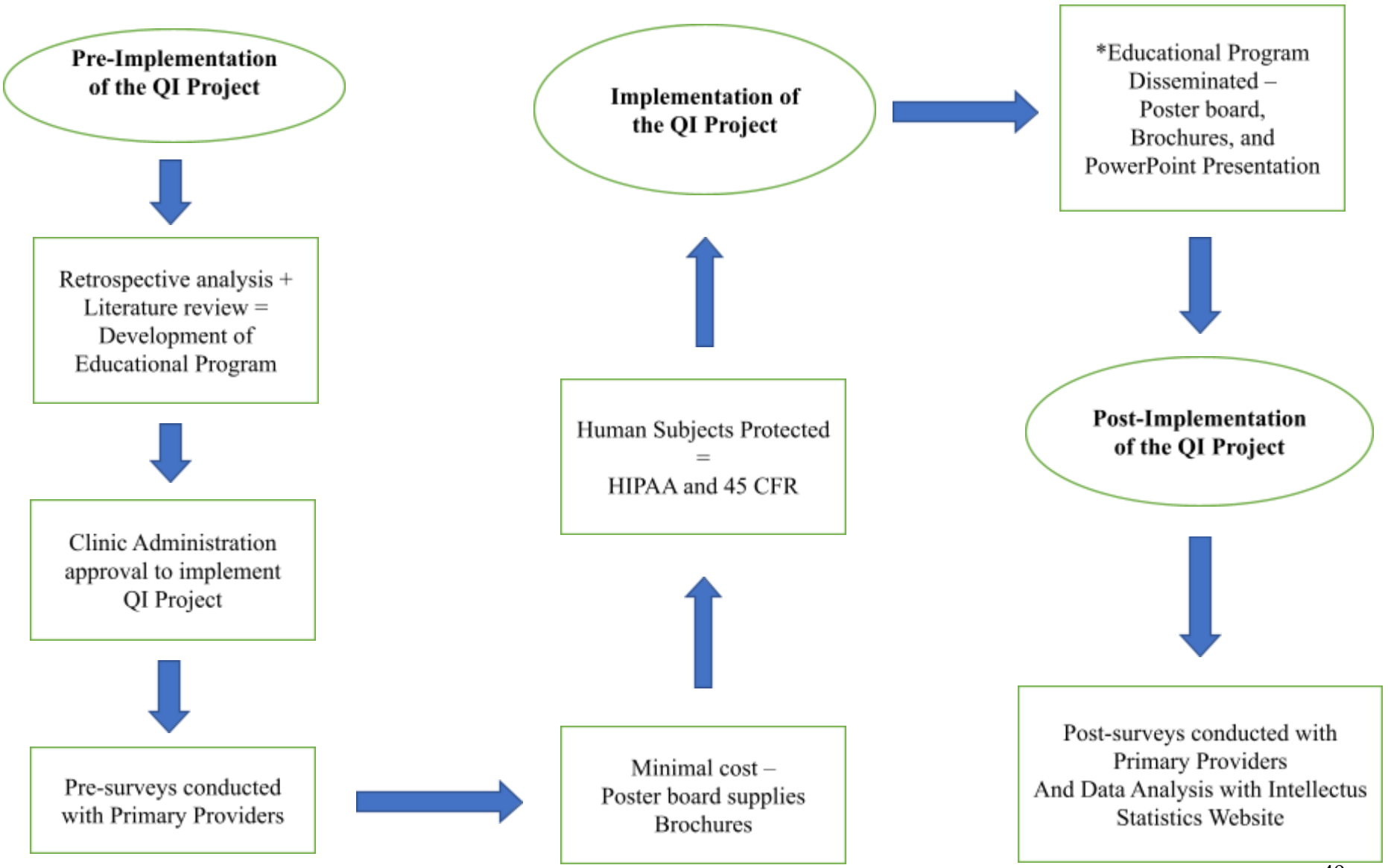
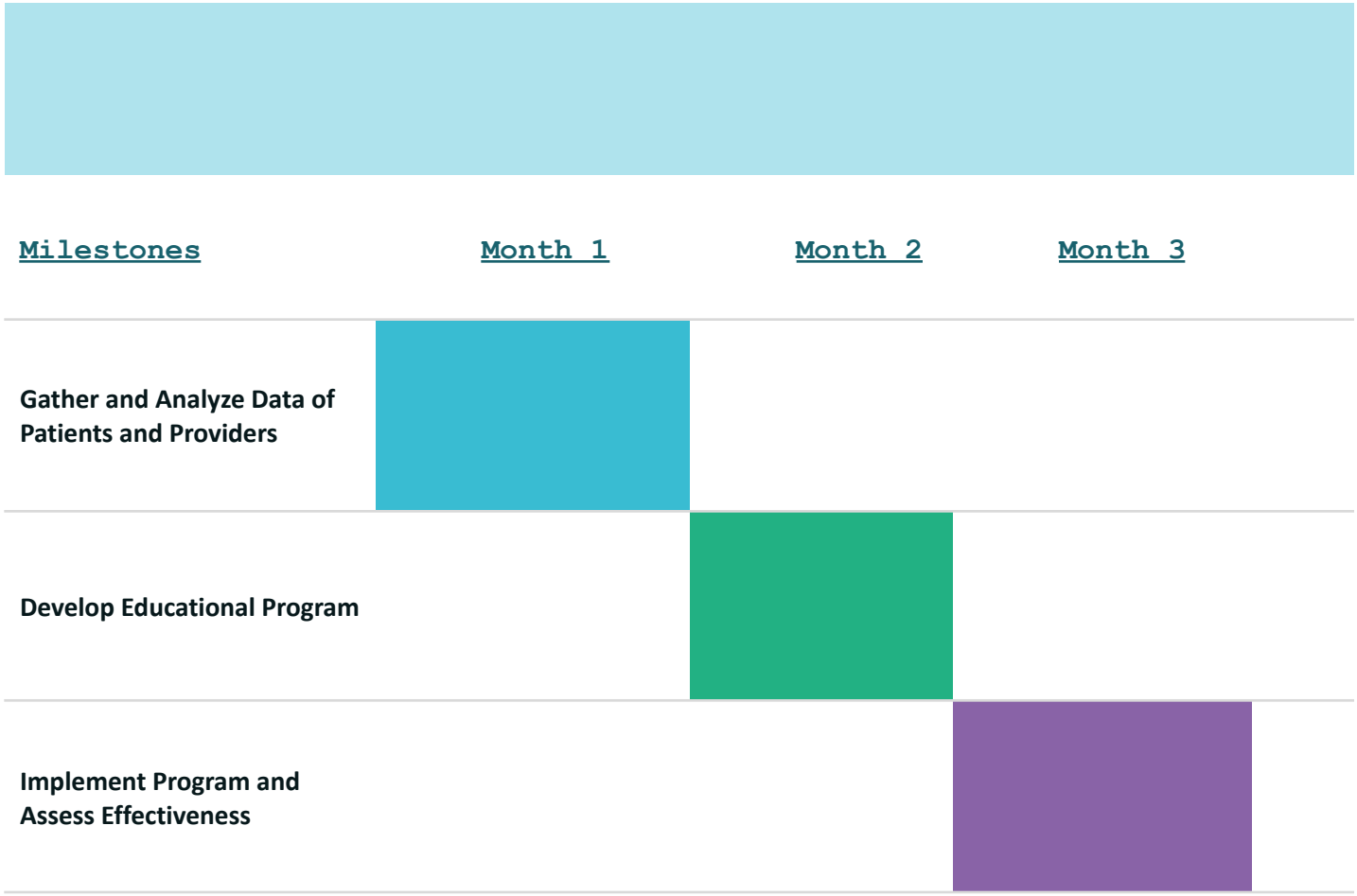
Appendix F

QI Project Methodology Flowchart



Appendix G


Milestones
Month 1
Month 2
Month 3
Gather and Analyze Data of Patients and Providers
Develop Educational Program
Implement Program and Assess Effectiveness

Appendix H

Improving Providers' Knowledge on CAMs: QI Project Estimated Timeline

PROJECT OBJECTIVES	START DATE	DUE DATE
1) **Gather Patient-Specific Data**	Week 1	End of Week 2
2) **Analyze Patient Data**	Week 3	End of Week 3
3) **Analyze Providers' Knowledge of CAMs**	Week 4	End of Week 4
4) **Develop Educational Program**	Week 5	End of Week 8
5) **Implement Educational Program**	Week 9	End of Week 10
6) **Assess Effectiveness**	Week 11	End of Week 12

Appendix I

Pre- Survey Questionnaire

1. Are you aware the clinic has acupuncture services available for patients experiencing chronic low back pain (CLBP)?

   Yes or No

2. How comfortable are you recommending CLBP patients for these services on a scale from 1-5? With 1 = not comfortable at all to 5 = extremely comfortable for referring these patients.

   1 2 3 4 5

3. If you are a provider, have you considered a magnesium supplement for any of your patients suffering with CLBP in the last 6 months?

   Yes or No
   If so, how many?_____

4. If you have referred/recommended CAM services in the last 6 months, how many of these referrals for CLBP patients were for acupuncture therapy?

   _____

Appendix J

Post- Survey Questionnaire

1. Are you aware the clinic has acupuncture services available for patients experiencing chronic low back pain (CLBP)?

   Yes or No

2. How comfortable are you recommending CLBP patients for these services on a scale from 1-5? With 1 = not comfortable at all to 5 = extremely comfortable for referring these patients.

   1 2 3 4 5

3. If you are a provider, have you considered a magnesium supplement for any of your patients suffering with CLBP in the last 6 months?

   Yes or No
   If so, how many?_____

4. If you have referred/recommended CAM services in the last 6 months, how many of these referrals for CLBP patients were for acupuncture therapy?

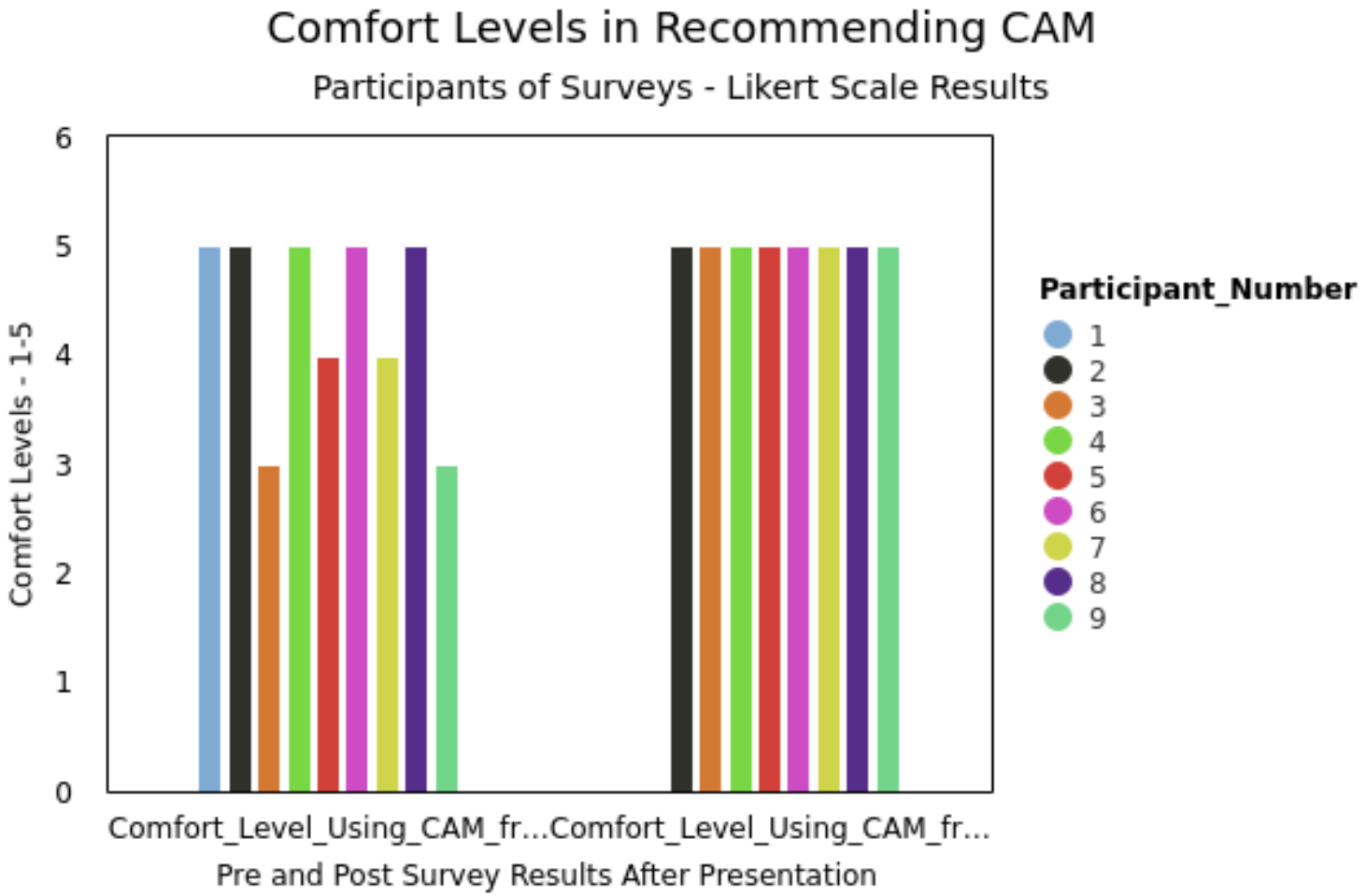
   _____

5. Did the information on acupuncture and magnesium supplementation improve your knowledge of CAM therapies and increase your comfort level in recommending these treatment options in your current position?

   Yes or No

Additional Feedback:

Appendix K


Comfort Levels in Recommending CAM
Participants of Surveys - Likert Scale Results
Comfort Levels - 1-5
0
1
2
3
4
5
6
Comfort_Level_Using_CAM_fr...
Comfort_Level_Using_CAM_fr...
Pre and Post Survey Results After Presentation
Participant_Number
1
2
3
4
5
6
7
8
9

Appendix L

Project Survey Results

# of Surveys	Aware of Acupuncture Service - Pre-Survey	Comfort Level for CAM - scale from 1-5 Pre-Survey	Considered using Mg - Pre-Survey	Number of Referrals for CAM in past 6 months	Aware of Acupuncture Service - Post-Survey	Comfort Level for CAM - scale from 1-5 Post-Survey	Considered using Mg - Post-Survey	Number of Referrals for CAM in past 6 months	Did the Presentation Improve Your Knowledge of CAM
1	Yes	5		1	N/A	N/A	N/A	N/A	N/A
2	Yes	5	No	2	Yes	5	No	2-provider does	Yes
3	Yes	3			Yes	5			Yes
4	Yes	5	No	0	Yes	5	No	1	Yes
5	Yes	4			Yes	5			Yes
6	Yes	5			Yes	5			Yes
7	Yes	4			Yes	5			Yes
8	Yes	5			Yes	5			Yes
9	Yes	3			Yes	5			Yes